# APPENDIX C

# MASE DETAILED ROUTING DESCRIPTIONS AND HIGH ALTITUDE AIRSPACE ROUTE CHANGES

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## C.1 OVERVIEW

The Proposed Action considered in this EA is the reconfiguration of the airspace system in the Cleveland and Detroit Metropolitan areas in accordance with the MASE airspace redesign. This MASE airspace redesign has been initiated to address the adjacent terminal or TRACON airspace related to Cleveland TRACON and ATCT (CLE) and Detroit TRACON and ATCT (D21/DTW), as well as some of the higher altitude en route airspace changes that have resulted from inter-facility airspace change negotiations over a wider high altitude en route airspace environment covering en route centers primarily east of the Mississippi River.

As mentioned in Chapter 1, Purpose & Need, an important aspect of MASE is how aircraft would be managed between the Detroit (D21) and Cleveland (CLE) terminal radar approach control (TRACON) airspace environments and the higher-altitude en route airspace environment. Recent runway construction projects at Detroit Metropolitan Wayne County (DTW) and Cleveland Hopkins International (CLE) airports provide for enhanced runway capacity. The MASE project seeks to accommodate the additional airport throughput afforded by the runway construction projects by establishing some new ingress and egress fixes and routes at the lateral boundaries of the D21 and CLE TRACON airspace areas. These lateral boundaries are located approximately 40 and 50 nautical miles, respectively, from each airport. Note that the MASE project would not change the basic aircraft flight patterns in the immediate vicinity of any airport.

Also, a number of multi-center design issues in the high-altitude stratum would be addressed in order to allow for greater flexibility and efficiency in the high-altitude airspace structure. The high-altitude en route airspace changes are needed to reduce congestion and delay in center airspace largely east of the Mississippi River. This congestion and delay arises when high air traffic volumes are routed via complex air traffic flows. The high-altitude multi-center reroutes would support the proposed low-altitude TRACON airspace changes at D21 and CLE. Importantly, the high-altitude multi-center reroutes would also enhance ATC capability to facilitate operational improvements throughout the high-altitude airspace environment encompassing the 2 primary (ZOB and ZID) and 10 other en route centers that constitute the bulk of MASE changes east of the Mississippi River.

The primary focuses and driving factors behind the purpose and need of this MASE project are the CLE and D21 TRACON airspace design issues, along with the high-altitude multi-center reroute issues affecting terminal and en route flows and congestion. The following subsections describe the detailed routing in the CLE and DTW/D21 terminal environments that constitute the MASE Airspace Redesign Environmental Study Area, followed by a description of the MASE high altitude routes that cover a 10 center area that constitutes the MASE High-Altitude Airspace Redesign Study Area.

## C.2 DETAILED ROUTING DESCRIPTIONS

The following detailed routing descriptions provide information on aircraft positioning relative to the primary arrival and departure runways for the CLE and DTW airports. **Table C-1** is a listing of the aeronautical fixes and NAVAID facilities, along with their locations used in these descriptions.

| Table C-1: MASE Aeronautical Fix and NAVAID Listing | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Type** | **Name** | **Associated Facility** | **Fix/NAVAID Use** | **NAVAID Type** | **Source** | **Latittude** | **Longitude** | **Location Description** |
| **Fix** | **ABERZ** | **ZOB** | Reporting Point | **NA** | New Fix | 40.9545 | -82.4778 | The ABERZ Fix is located approximately 46 miles southwest of CLE in northeast Richland County, OH. |
| **Fix** | **ALPHE** | **ZOB** | Reporting Point | **NA** | AirNav.com | 42.4359 | -84.5099 | The ALPHE Fix is located approximately 61 miles west northwest of DTW in southwest Ingham County, MI. |
| **Fix** | **AMRST** | **ZOB** | Reporting Point | **NA** | New Fix | 41.2450 | -82.9888 | The ARMST Fix is located approximately 60 miles west southwest of CLE in northern Seneca County, OH |
| **Fix** | **ANNTS** | **ZOB** | Reporting Point | **NA** | AirNav.com | 41.6836 | -83.7906 | The ANNTS Fix is located approximately 44 miles south southwest of DTW in north western Lucas County, OH |
| **Fix** | **CAVVS** | **ZOB** | Reporting Point | **NA** | AirNav.com | 41.6841 | -83.5691 | The CAVVS Fix is located approximately 39 miles south southwest of DTW in north central Lucas County, OH |
| **Fix** | **CETUS** | **ZOB** | Reporting Point | **NA** | AirNav.com | 41.7037 | -82.8171 | The CETUS Fix is located over Lake Erie approximately 55 miles west northwest of CLE and 45 miles south southeast of DTW (just south of North Bass Island, and north of Middle Bass Island) |
| **Fix** | **CHOOT** | **ZOB** | Reporting Point | **NA** | AirNav.com | 41.5257 | -83.3348 | The CHOOT Fix is located approximately 47 miles south of DTW in southwest Ottawa County, OH |
| **Fix** | **DUNKS** | **ZOB** | Reporting Point | **NA** | AirNav.com | 42.4274 | -84.1942 | The DUNKS Fix is located approximately 46 miles west northwest of DTW in southeast Ingham County, MI |
| **Fix** | **EARVN** | **ZOB** | Reporting Point | **NA** | AirNav.com | 42.5206 | -84.1901 | The EARVN Fix is located approximately 48 miles northwest of DTW in east central Ingham County, MI |
| **Fix** | **ERRTH** | **ZOB** | Reporting Point | **NA** | New Fix | 42.2250 | -82.4490 | The ERRTH Fix is located approximately 46 miles east of DTW in Ontario, Canada a few miles south southwest of Tilbury, Ontario |
| **Fix** | **FAILS** | **ZOB** | Reporting Point | **NA** | AirNav.com | 41.8378 | -81.4204 | The FAILS Fix is located over Lake Erie, approximately 10 miles north of the Willoughby Lost Nation Municipal Airport, and approximately 37 miles northeast of CLE |
| **Fix** | **FILUP** | **ZOB** | Reporting Point | **NA** | AirNav.com | 41.5666 | -83.1856 | The FILUP Fix is located approximately 46 miles south southeast of DTW in north centeral Ottawa County, OH |
| **Fix** | **GEMNI** | **ZOB** | Reporting Point | **NA** | New Fix | 41.7236 | -82.7828 | The GEMNI Fix is located over Lake Erie (NE of North Bass Island) approximately 45 miles southeast of DTW and approximately 54 miles west northwest of CLE |
| **Fix** | **GILLS** | **ZOB** | Reporting Point | **NA** | AirNav.com | 41.8853 | -81.8502 | The GILLS Fix is located over Lake Erie approximately 33 miles north of CLE and approximately 80 miles east southeast of DTW |
| **Fix** | **GONNE** | **ZOB** | Reporting Point | **NA** | AirNav.com | 41.8396 | -82.0506 | The GONNE Fix is located over Lake Erie approximately 32 miles north northwest of CLE and approximately 72 miles southeast of DTW |
| **Fix** | **HADAR** | **ZOB** | Reporting Point | **NA** | AirNav.com | 42.3650 | -82.4839 | The HADAR Fix is located approximately 45 miles east northeast of DTW in Ontario, Canada positioned over the southeast corner of Lake St. Clair |
| **Fix** | **HARWL** | **ZOB** | Reporting Point | **NA** | AirNav.com | 42.2640 | -84.1941 | The HARWL Fix is located approximately 42 miles west northwest of DTW in east central Jackson County, MI |
| **Fix** | **HEGEL** | **ZOB** | Reporting Point | **NA** | AirNav.com | 42.5823 | -81.4828 | The HEGEL Fix is located approximately 83 miles north northeast of CLE, and 99 miles northeast of DTW in Ontario, Canada a few miles south of Dutton, Ontario on the Lake Erie shoreline |
| **Fix** | **HERAK** | **ZOB** | Reporting Point | **NA** | New Fix | 40.9153 | -82.0347 | The HERAK Fix is located approximately 36 miles south southwest of CLE in northwest Wayne County, OH |
| **Fix** | **HIMEZ** | **ZOB** | Reporting Point | **NA** | New Fix | 41.8512 | -82.2003 | The HIMEZ Fix is located over Lake Erie approximately 36 miles norhtwest of CLE and approximately 65 miles southeast of DTW |
| **Fix** | **JUNKR** | **ZOB** | Reporting Point | **NA** | AirNav.com | 41.8139 | -82.6655 | The JUNKR Fix is located over Lake Erie, just north of Pelee Island approximately 51 miles norhtwest of CLE and approximately 45 miles southeast of DTW |
| **Fix** | **KEATN** | **ZOB** | Reporting Point | **NA** | AirNav.com | 40.9314 | -81.6556 | The KEATN Fix is located approximately 35 miles south southeast of CLE in northeast Wayne County, OH |
| **Fix** | **KITTY** | **ZOB** | Reporting Point | **NA** | AirNav.com | 41.6614 | -82.1620 | The KITTY Fix is located over Lake Erie approximately 24 miles northwest of CLE and approximately 73 miles southeast of DTW |
| **Fix** | **LAYNE** | **ZOB** | Reporting Point | **NA** | AirNav.com | 42.9134 | -83.3667 | The LAYNE Fix is located approximately 48 miles north of DTW in southsest Lapeer County, MI |
| **Fix** | **LEBRN** | **ZOB** | Reporting Point | **NA** | New Fix | 41.4522 | -81.6433 | The LEBRN Fix is located approximately 10 miles east northeast of CLE in the Newburgh Heights area of Cleveland, OH |
| **Fix** | **LLEEO** | **ZOB** | Reporting Point | **NA** | New Fix | 41.8425 | -82.6230 | The LLEEO Fix is located over Lake Erie, just north of Pelee Island approximately 51 miles norhtwest of CLE and approximately 45 miles southeast of DTW |
| **Fix** | **MAARS** | **ZOB** | Reporting Point | **NA** | New Fix | 42.0883 | -82.4862 | The MAARS Fix is located approximately 58 miles north northwest of CLE and approximately 45 miles east southeast of DTW in Ontario, Canada a few miles northeast of Leamington, Ontario |
| **Fix** | **MIZAR** | **ZOB** | Reporting Point | **NA** | AirNav.com | 41.8258 | -84.0398 | The MIZAR Fix is located approximately 45 miles southwest of DTW in south central Lenawee County, MI |
| **Fix** | **MOONN** | **ZOB** | Reporting Point | **NA** | New Fix | 42.3737 | -82.4518 | The MOONN Fix is located approximately 47 miles east northeast of DTW in Ontario, Canada positioned over the southeast corner of Lake St. Clair |
| **Fix** | **OBRLN** | **ZOB** | Reporting Point | **NA** | New Fix | 41.1065 | -82.7348 | The OBRLN Fix is located approximately 51 miles  southwest of CLE in west central Huron County, OH |
| **Fix** | **PICES** | **ZOB** | Reporting Point | **NA** | New Fix | 42.7791 | -82.1858 | The PICES Fix is located approximately 71 miles northeast of DTW, and 96 miles north northwest of CLE in Ontario, Canada approximately 7 miles south of Petrolia, Ontario |
| **Fix** | **POLAR** | **ZOB** | Reporting Point | **NA** | AirNav.com | 42.8374 | -83.7354 | The POLAR Fix is located approximately 47 miles north northwest of DTW in south Genesee County, MI |
| **Fix** | **SCORR** | **ZOB** | Reporting Point | **NA** | AirNav.com | 41.6718 | -83.3415 | The SCORR Fix is located approximately 38 miles south of DTW and approximately 80 miles west notthwest of CLE in eastern Lucas County, OH |
| **Fix** | **SPICA** | **ZOB** | Reporting Point | **NA** | AirNav.com | 42.5084 | -82.5463 | The SPICA Fix is located approximately 46 miles northeast of DTW in Ontario, Canada positioned over the northern shoreline of Lake St. Clair |

| Table C-1: MASE Aeronautical Fix and NAVAID Listing | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Type** | **Name** | **Associated Facility** | **Fix/NAVAID Use** | **NAVAID Type** | **Source** | **Latittude** | **Longitude** | **Location Description** |
| **Fix** | **SSUNN** | **ZOB** | Reporting Point | **NA** | New Fix | 41.9615 | -82.5517 | The SSUNN Fix is located over Lake Erie, just south southeast of Learnington, Ontario approximately 53 miles north norhtwest of CLE and approximately 45 miles southeast of DTW |
| **Fix** | **TYCOB** | **ZOB** | Reporting Point | **NA** | AirNav.com | 42.2392 | -82.4443 | The TYCOB Fix is located approximately 46 miles east of DTW and approximately 65 miles north northwest of CLE in Ontario, Canada a few miles south of Tilbury, Ontario |
| **Fix** | **URSSA** | **ZOB** | Reporting Point | **NA** | New Fix | 41.8469 | -82.6322 | The URSSA Fix is located over Lake Erie approximately 45 miles southeast of DTW and approximately 51 miles northwest of CLE |
| **Fix** | **VARYS** | **ZOB** | Reporting Point | **NA** | AirNav.com | 41.5504 | -82.3733 | The VARYS Fix is located over Lake Erie approximately 30 miles west northwest of CLE and approximately 68 miles south southeast of DTW |
| **Fix** | **WAKEM** | **ZOB** | Reporting Point | **NA** | AirNav.com | 41.2852 | -82.4586 | The WAKEM Fix is located approximately 33 miles southwest of CLE and approximately 80 miles southeast of DTW in southeast Erie County, OH |
| **Fix** | **WEEDA** | **ZOB** | Reporting Point | **NA** | New Fix | 41.7158 | -83.0642 | The WEEDA Fix is located over Lake Erie approximately 38 miles south southeast of DTW and approximately 67 miles west northwest of CLE |
| **Fix** | **WINGS** | **ZOB** | Reporting Point | **NA** | AirNav.com | 42.0648 | -82.4752 | The WINGS Fix is located approximately 46 miles east southeast of DTW and approximately 56 miles north northwest of CLE in Ontario, Canada a few miles east northeast of Leamington, Ontario |
| **NAVAID** | **ACO** | **CAK** | Navigational Aid | Akron VOR/DME | AirNav.com | 41.1079 | -81.2015 | The Akron NAVAID is located approximately 39 miles southeast of CLE in central Portage County, OH |
| **NAVAID** | **APE** | **DAY** | Navigational Aid | Appleton VORTAC | AirNav.com | 40.1511 | -82.5883 | The Appleton NAVAID is located approximately 96 miles south southwest of CLE in west central Licking County, OH |
| **NAVAID** | **CXR** | **CLE** | Navigational Aid | Chardon VOR/DME | AirNav.com | 41.5170 | -81.1632 | The Chardon NAVAID is located approximately 36 miles east northeast of CLE in central Geauga County, OH |
| **NAVAID** | **MFD** | **MFD** | Navigational Aid | Mansfield VORTAC | AirNav.com | 40.8686 | -82.5910 | The Mansfield NAVAID is located approximately 54 miles southwest of CLE in central Richland County, OH |
| **NAVAID** | **SKY** | **CLE** | Navigational Aid | Sandusky VOR/DME | AirNav.com | 41.4345 | -82.6548 | The Mansfield NAVAID is located approximately 42 miles west of CLE and approximately 65 miles south southeast of DTW in north central Erie County, OH |
| **NAVAID** | **CAK** | **NA** | Navigational Aid | Akron/Canton Regional VOT | AirNav.com | 40.9163 | -81.4421 | The Akron/Canton NAVAID is located approximately 40 miles south southeast of CLE in southeast Summit County, OH |
| **NAVAID** | **CRL** | **LAN** | Navigational Aid | Carleton VORTAC | AirNav.com | 42.0481 | -83.4576 | The Carleton NAVAID is located approximately 13 miles south southwest of DTW in north central Monroe County, MI |
| **NAVAID** | **VWV** | **CLE** | Navigational Aid | Waterville VOR/DME | AirNav.com | 41.4515 | -83.6387 | The Waterville NAVAID is located approximately 93 miles west of CLE and approximately 55 miles south southwest of DTW in north central Wood County, OH |
| **NAVAID** | **DJB** | **CLE** | Navigational Aid | Dryer VOR/DME | AirNav.com | 41.3581 | -82.1620 | The Dryer NAVAID is located approximately 17 miles west southwest of CLE in central Lorain County, OH |

## C.3 NO ACTION AIRSPACE ALTERNATIVE

The existing airspace structure (the No Action Airspace Alternative) relies on a system of fixes, routes, and procedures to direct aircraft through the Cleveland and Detroit Metropolitan area airspace. ATC operates in a systematic manner such that all flights arriving or departing the two primary airports and associated satellite airports are typically assigned to routes that are complementary to the runway use and airspace configurations being used at any given time. Typically due to changes in demand characteristics and/or airport infrastructural improvements (e.g., new runways), these procedures become inefficient over time and must be assessed to determine options for improved service.

In describing the existing airspace, a series of arrival posts and departure gates that equate to a number of individual NAVAIDS and/or aeronautical fixes are used to define standardized points along existing prescribed flight paths. These prescribed flight paths or structured procedures are used to ensure safe separation between aircraft that are moved within an airspace sector (i.e., individual ATC airspace volumes designed for a single radar controller to provide safe, orderly and expeditious ATC service), and between intra-facility individual TRACON airspace sector boundaries, as well as inter-facility TRACON to TRACON, or TRACON to ARTCC (i.e., Center) sector boundaries.

Specifically, these sector boundaries occur within and between the Cleveland and Detroit TRACON facilities, as well as between these TRACON facilities and the higher, overlying en route airspace of the Cleveland Center. In addition, similar sector boundaries occur between multiple high altitude en route Center facilities that are adjacent to one another across the continental United States. These Center to Center sector boundaries comprise the inter-facility transition points between these high-altitude ATC facilities, and are involved in the MASE high altitude routing changes identified in Section C.5 of this appendix.

The description of the existing airspace structure (the No Action Airspace Alternative) has been developed based on a generalized overview of the arrival and departure flows that comprise ATC routing for the primary Cleveland and Detroit airports. In addition, detailed information on the various airspace configuration flows and runway use methodology is provided that describes how these fixes, routes, and procedures are structured to direct aircraft into and out of the Cleveland and Detroit area defined as the MASE Airspace Redesign Environmental Study Area.

### C.3.1 No Action Airspace Alternative – CLE Arrivals

Cleveland (CLE) arrivals for the No Action Airspace Alternative represent a variety of existing procedures for entering CLE airspace to access the primary northeast and southwest runways. Descriptions of these arrival procedures will provide context when describing the proposed alternative airspace design changes. Note that references to standardized ATC traffic patterns (e.g., downwind, base and final legs) are explained in detail in **Appendix B**.

NAVAIDS and Fixes comprising CLE arrivals reflect the following high-level attributes when comparing the No Action Airspace Alternative and the MASE Alternative:

- GONNE the existing north arrival fix for CLE is replaced by HIMEZ in the MASE Alternative

- The existing Chardon (CXR) VOR/DME NAVAID and KEATN fix continue to function as arrival points for CLE in both the No Action and MASE Alternatives.

- The existing WAKEM arrival fix will have traffic shifted to a new ABERZ fix and the new HIMEZ fix in the MASE Alternative. Note that VWV-WAKEM transition arrivals are routed to HIMEZ, while the ROD-WAKEM transition arrivals are routed to ABERZ. These WAKEM arrivals represent an approximate 60/40 split between HIMEZ and ABERZ for the VWV-WAKEM and ROD-WAKEM transitions respectively.

- The new ABERZ fix functions as a southwest arrival point for CLE arrivals in the MASE Alternative Airspace Redesign. Note that in the No Action alternative the existing MFD NAVAID functions as a departure fix. Due to the proximity of MFD to ABERZ, the MFD NAVAID will no longer be used as a departure point in the MASE Airspace Redesign Alternative.

### C.3.1.1 Overview of No Action Airspace Alternative - CLE Arrivals

**CLE Arrivals to Runways 06L and 06R**

Arrivals to Runways 06L and 06R at CLE originate from a number of nodal points surrounding CLE airspace. Arrivals from the east and northeast arrive over the Chardon VOR/DME NAVAID (CXR) located in central Geauga County, OH, near Chardon, OH. Arrivals from the south and southwest arrive over the KEATN aeronautical fix located in northeast Wayne County, OH, approximately 3 miles southeast of Doylestown, OH. Arrivals from the southwest and west come into CLE airspace over the WAKEM aeronautical fix. This arrival point is located in southeast Huron County, OH. Northwest and northeast arrivals are sent over the GONNE aeronautical fix, located in the middle of Lake Erie approximately 23 miles due north of the Lake Erie shoreline between Sheffield Lake, OH and Avon Lake, OH.

**CLE Arrivals to Runways 24L and 24R**

Arrivals to Runways 24L and 24R at CLE originate from the same nodal points surrounding CLE airspace that were described in the previous section for Runways 06L and 06R. There are, however differences between how arrivals transition from these common arrival NAVAIDS and aeronautical fixes for 24L and 24R arrivals transitioning to a final approach from the northeast, versus 06L and 06R arrivals transitioning to a final approach from the southwest. These differences are explained in the following paragraphs.

#### C.3.1.1.1 CLE No Action Airspace Alternative – GONNE (North) Arrivals (06L/24R and 06R/24L)

There is a change with the existing GONNE arrivals which will shift this traffic further west to the HIMEZ fix in the MASE Airspace Redesign Alternative.

CLE arrivals from the north northwest and northeast typically arrive via the GONNE arrival fix located approximately 23 miles due north of the Lake Erie shoreline between Sheffield Lake, OH and Avon Lake, OH. Aircraft are routed from this fix to the southeast almost directly towards CLE, where they typically turn in one of two directions depending on which runways are being used. Arriving from GONNE when the southwest runways (24L & 24R) are being used, the aircraft turn left towards the northeast to initiate a downwind leg for a typical runway approach pattern. If the northeast runways (06L & 06R) are being used the aircraft for 06L turn right towards the southwest at a point west of the airport, whereas 06R arrivals continue southeast from the fix to a point east of the airport before turning southwest to initiate a downwind leg.

Runway 24L & 24R arrivals from GONNE turn towards the northeast (downwind leg) for sequencing to these runways. These 24L and 24R arrivals parallel the Lake Erie shoreline at a distance of approximately 4-5 miles until making a right turn towards the southeast (base leg), and another right turn towards the southwest (final leg) to set up for the final approach for either Runway 24L or 24R. The turn from the downwind leg to the base leg along the shoreline for these arrivals can occur anywhere between Eastlake, OH to Lakewood, OH depending on traffic volume, along the extended runway centerlines for these southwest arrival runways.

Runway 06L arrivals from GONNE turn towards the southwest (downwind leg) for sequencing to this runway. These 06L arrivals parallel the runway (to the northwest) at a distance of approximately 4-5 miles roughly paralleling SR-10/US-20 until making a left turn towards the southeast (base leg), and another left turn towards the northeast (final leg) to set up for the final approach to Runway 06L. The turn from the downwind leg to the base leg along the SR-10/US-20 corridor for these arrivals can occur anywhere between North Olmstead, OH to Wellington, OH, depending on traffic volume. The turn to final is made along the extended runway centerline for 06L, again depending on where the downwind to base leg turn is initiated.

Runway 06R arrivals from GONNE continue southeast over the airport to intersect a right downwind leg in the area east of I-71 and north of I-80. These 06R arrivals are at this point headed on southwesterly track on a right downwind for 06R at a distance of approximately 4-5 miles of the extended runway centerline, until making a right turn towards the northwest (base leg), and another right turn towards the northeast (final leg) to set up for the final approach to Runway 06R. The turn from the downwind leg to the base leg for these arrivals can occur anywhere between Berea, OH to south of Columbia Station, OH, depending on traffic volume. The turn to final is made along the extended runway centerline for 06L, again depending on where the downwind to base leg turn is initiated.

#### C.3.1.1.2 CLE No Action Airspace Alternative – CXR (East) Arrivals (06L/24R and 06R/24L)

Note that there are no changes from the No Action Airspace Alternative to the MASE Airspace Redesign Alternative for CXR arrivals.

Cleveland arrivals from the northeast and east arrive over the Chardon VOR/DME NAVAID (CXR) located in central Geauga County, OH, near Chardon, OH, and are also either sequenced for 24L and 24R, or 06L and 06R depending on the prevailing winds and runway usage strategy.

If the southwest runways (24L & 24R) are being used the aircraft are either vectored from CXR to the northwest in the vicinity of Willoughby, OH to intercept a base leg for one of the 24s. Alternately, depending on traffic volume these aircraft are vectored southwest from CXR towards a point in the vicinity of I-77 and SR-14/SR-43, north of Harvard Ave (LEBRN Fix) to intercept a downwind leg that would then take the aircraft northeast towards Willoughby to then intercept the base leg for one of the 24s.

If the northeast runways (06L & 06R) are being used the aircraft are typically vectored from the LEBRN Fix to either the east or west side of the airport. For the west side of the airport, CXR 06L arrivals fly north of the airport between I-90 and I-71 until approximately 3 miles north of the airport, where these aircraft turn southwest. These 06L arrivals parallel the runways at a distance of approximately 4-5 miles roughly paralleling SR-10/US-20 until making a left turn towards the southeast (base leg), and another left turn towards the northeast (final leg) to set up for the final approach for Runway 06L. Again, the turn from the downwind leg to the base leg along the SR-10/US-20 for these arrivals can occur anywhere between North Olmstead, OH to Wellington, OH depending on traffic volume. The turn to final is made along the extended runway centerline for 06L, depending on where the downwind to base leg turn is initiated.

The east side approach to 06R starts just slightly south of the CXR NAVAID and proceeds west southwest, passing just north of where I-271 and I-480 diverge near Bedford Heights. The track continues in this direction crossing I-77 and I-480 intersection, and crossing I-71 where the downwind leg for 06R is intercepted with a turn to the southwest. This southwest downwind track can extend from Berea, OH to southeast of Lagrange, OH (and sometimes further) before a turn to the northwest for a base leg is initiated, followed by a turn to the northeast to intercept the extended runway centerline for Runway 06R. Again, the length of the downwind leg and the turn to base leg is determined by aircraft volume.

#### C.3.1.1.3 CLE No Action Airspace Alternative – KEATN (South) Arrivals (06L/24R and 06R/24L)

Note that there are no changes from the No Action Airspace Alternative to the MASE Airspace Redesign Alternative for KEATN arrivals.

Cleveland arrivals from the southeast and south arrive over the KEATN fix located in northeast Wayne County, OH, approximately 3 miles southeast of Doylestown, OH. These flows converge on an area south southwest of the airport for 06L and 06R and south southeast of the airport for 24L and 24R.

KEATN arrivals are also either sequenced for 24L and 24R, or 06L and 06R depending on the prevailing winds and runway usage strategy. If the northeast runways (06L & 06R) are being used the aircraft are vectored from KEATN to the northwest towards an area between Columbia Station, OH to an area approximately 2 miles east along SR-82 to intercept a base leg for either 06R or 06L. In some instances these aircraft may be vectored to a downwind leg that is headed southwest away from the airport before turning northwest for a base leg, and finally northeast on a final for either 06L or 06R. This pattern can take these 06L and 06R arrivals as far southwest as Eaton, OH depending on traffic volume.

For 24L and 24R arrivals, these aircraft are typically vectored north northwest from KEATN towards a point in the vicinity of where I-71 and I-80 intersect for 24R, or are vectored due north towards Newburgh Heights, OH (towards the LEBRN fix) to intercept a base leg for primarily 24L. The north northwest flow for 24R arrivals would be vectored over the top of CLE and turn north until over the lake where a right turn towards the northeast would be initiated for a downwind leg for Runway 24R. These 24R arrivals parallel the shoreline at a distance of approximately 4-5 miles until making a right turn towards the southeast (base leg), and another right turn towards the southwest (final leg) to set up for the final approach for Runway 24R. The turn from the downwind leg to the base leg along the shoreline for these arrivals can occur anywhere from Eastlake, OH to Lakewood, OH, along the extended runway centerline for Runway 24R.

In some instances during high demand the 24L arrivals could be vectored from the point in the vicinity of where I-71 and I-80 intersect towards the north along I-71 initiating an extended downwind leg for Runway 24L. These 24L arrivals parallel the extended Runway 24L centerline at a distance of approximately 4-5 miles inland until making a left turn towards the northwest (base leg), and another left turn towards the southwest (final leg) to set up for the final approach for Runway 24L. Again, the turn from the downwind leg to the base leg along the shoreline for these arrivals can occur anywhere from Eastlake, OH to Lakewood, OH, along the extended runway centerline for Runway 24L. Again, when traffic volume permits, KEATN arrivals to 24L are vectored due north to a point in the vicinity of the I-77 and I-480 interchange to intercept a direct base leg for 24L. These aircraft turn southwest on final for 24L, south and west of Burke Lakefront Airport.

#### C.3.1.1.4 CLE No Action Airspace Alternative – WAKEM (West) Arrivals (06L/24R and 06R/24L)

There is a change in WAKEM fix arrival traffic which will shift primarily to the new ABERZ (Southwest) fix in the MASE Airspace Redesign Alternative. WAKEM would cease to exist as an arrival fix in the MASE alternative. The VWV-WAKEM transition traffic which comprises approximately 60% of WAKEM traffic would be routed to the new HIMEZ fix, while the ROD-WAKEM transition traffic which comprises approximately 40% of WAKEM traffic would be routed to the new ABERZ fix. The WAKEM fix would cease to exist as an arrival fix in the MASE alternative.

Cleveland arrivals from the southwest and west arrive over the WAKEM aeronautical fix located in southeast Erie County, OH, approximately 5 miles west of Wakeman Airport and 5 miles northeast of Norwalk-Huron County Airport. These arrivals are also either sequenced for 24L and 24R, or 06L and 06R depending on the prevailing winds and runway usage strategy.

If the southwest runways (24L & 24R) are being used the aircraft are vectored from the southwest WAKEM aeronautical fix to a point in the vicinity of the interchange between I-480/SR-20 and I-80. Aircraft are then either vectored northeast to an area west of SR-252 and south of I-90 to start the downwind leg for Runway 24R, or are vectored east to an area north of US-42 and west of I-71 to start the downwind leg for Runway 24L. The downwind, base and final legs for the approaches to 24L and 24R are similar to those described for the KEATN 24L arrivals or the GONNE 24R arrivals.

If the northeast runways (06L & 06R) are being used the aircraft are typically vectored from the WAKEM Fix to a point southwest of the CLE ranging from the areas of Oberlin, OH towards Elyria, OH. Aircraft along the line between these two areas could enter a base leg towards the southeast for either 06L or 06R, and could turn northeast on a final leg for either of these runways ranging from an area in the vicinity of Lagrange, OH to Eaton, OH, depending on the point along which a base leg was intercepted (i.e., from Oberlin, OH towards Elyria, OH).

### C.3.2 No Action Airspace Alternative – CLE Departures

Cleveland (CLE) departures for the No Action Airspace Alternative represent a variety of existing procedures exiting CLE airspace once departing from the primary northeast and southwest runways. Descriptions of these departure procedures will provide context when describing the proposed alternative airspace design changes.

NAVAIDS and Fixes comprising Cleveland departures reflect the following high-level attributes when comparing the No Action Airspace Alternative and the MASE Alternative.

- The existing Akron (ACO) VOR/DME NAVAID, Appleton (APE) VORTAC NAVAID, Sandusky (SKY) VOR/DME NAVAID and the FAILS fix continue to function as departure points for CLE in both the No Action and the MASE Alternatives.

- Departures from CLE arriving at DTW and its satellites that use the CETUS and JUNKR fixes will use WEEDA (new) and GEMNI (replaces CETUS), while JUNKR (DTW satellite) flights transition to LLEEO.

- The existing Mansfield (MFD) VORTAC NAVAID is replaced as an arrival point (by the new ABERZ fix) for CLE arrivals as opposed to functioning as a departure point in the No Action Airspace Alternative, while the OBRLN and AMRST departures fixes replace MFD as a departure point for southwest and west departures.

- Note that the GILLS fix will continue to be used in a limited manner for intra-study CLE departures (i.e., CLE departures to destinations north and northwest of DTW not landing in D21 controlled airports) in the No Action and MASE Airspace Alternative, although some intra-study GILLS departures will transition to LLEEO.

#### C.3.2.1 Overview of No Action Airspace Alternative - CLE Departures

**CLE Departures from Runways 06L and 06R**

Departures from Runways 06L and 06R at CLE initiate their egress from a number of nodal points surrounding CLE airspace. Departures to the north depart over the GILLS fix located approximately 27 miles due north of Rocky River, OH in the middle of Lake Erie. Departures to the northeast depart over the FAILS fix located over Lake Erie, approximately 10 miles north of the Willoughby Lost Nation Municipal Airport.

Departures to the east and southeast depart over the Akron VOR/DME NAVAID (ACO) located approximately 40 miles southeast of CLE in Portage County, OH, north of I-76 and east of SR-5. Departures to the south and southwest depart over the Appleton VORTAC NAVAID (APE)

located approximately 95 miles south southwest of CLE in Licking County, OH, approximately 5 miles east of Johnstown, OH.

Northwest departures use the Sandusky VOR/DME NAVAID (SKY) located in Erie County on the Griffing Sandusky Airport approximately 42 miles west of CLE. In addition, northwest departures use the CETUS and JUNKR departures fixes. The CETUS departure fix is located approximately 55 miles northwest of CLE over Lake Erie, just south of North Bass Island. The JUNKR departure fix is located approximately 50 miles northwest of CLE over Lake Erie, just north of Pelee Island, Ontario.

**CLE Departures from Runways 24L and 24R**

Departures from Runways 24L and 24R at CLE depart from the same nodal points surrounding CLE airspace that were described in the previous section for Runways 06L and 06R. There are, however differences between how departures transition from these common departure NAVAIDS and aeronautical fixes for 24L and 24R departures transitioning from the southwest of CLE, versus 06L and 06R departures transitioning from the northeast of CLE. These differences are explained in the following paragraphs.

#### C.3.2.1.1 CLE No Action Airspace Alternative – GILLS Departures (06L/24R and 06R/24L)

Note that there are minor changes from the No Action to the MASE Airspace Redesign Alternative for GILLS departures in that some intra-study GILL departures move from GILLS to LLEEO.

The GILLS departure fix is located approximately 27 miles due north of Rocky River, OH in the middle of Lake Erie. GILLS departures to the north in the No Action Airspace Alternative are used for intra-study flights (i.e., CLE departures to destinations within the study area towards airports north and northwest of DTW). For 06L and 06R departures from these northeast runways, aircraft depart to the east of the Rocky River Reservation roughly along SR-237 to the north northeast heading out over Lake Erie roughly near Lakewood, OH. Approximately 12 miles from the shoreline these aircraft turn slightly left to the north northwest to intercept the GILLS fix over Lake Erie.

For 24L and 24R departures from these southwest runways, aircraft depart either of the two runways and head initially towards the west while wrapping around to the north. Runway 24R departures would track to the east of the 24L departures as they wrap around to the north and cross the Lake Erie shoreline approximately between Bradley Rd. and Columbia Rd.

#### C.3.2.1.2 CLE No Action Airspace Alternative – FAILS (Northeast) Departures (06L/24R and 06R/24L)

Note that there are no changes from the No Action to the MASE Airspace Redesign Alternative for FAILS departures.

The FAILS departure fix is located over Lake Erie, approximately 10 miles north of the Willoughby Lost Nation Municipal Airport. FAILS departures from 06L would typically

comprise jet aircraft climbing to flight levels (i.e., above 18,000 feet – FL180), while 06R departures would comprise those aircraft under 10,000 feet. The track of 06L jets would take these aircraft to the east of the Rocky River Reservation roughly along SR-237 to the north northeast heading out over Lake Erie roughly near Lakewood, OH. Approximately 10 miles from the shoreline some of these aircraft turn right towards the northeast to intercept the FAILS fix, while other aircraft continue north northeast.

FAILS departures from 06R typically comprise non-jet aircraft staying below 10,000 feet. These aircraft depart on a more northeast heading directly towards FAILS and cross the Lake Erie shoreline approximately 2 miles east of where the 06L FAILS departures would cross.

For FAILS 24L and 24R departures, aircraft depart either of the two runways and head initially towards the west while wrapping around to the north. Runway 24R departures would track to the east of the 24L departures as they wrap around to the north and cross the Lake Erie shoreline approximately between SR-83 and Columbia Rd. Note that many of these departures that do not fly all the way to FAILS and subsequent points beyond are dispersed on westerly to easterly routes at points along the northeast track to FAILS. In addition, some low altitude tracks make tight right or left turns off the runway and proceed to numerous points northeast and beyond.

#### C.3.2.1.3 CLE No Action Airspace Alternative – ACO (Southeast) Departures (06L/24R and 06R/24L)

Note that there are no changes from the No Action Airspace Alternative to the MASE Airspace Redesign Alternative for ACO departures.

The Akron VOR/DME NAVAID (ACO) is located approximately 40 miles southeast of CLE in Portage County, OH, north of I-76 and east of SR-5. Runway 06L and 06R departures towards ACO depart these runways in an arc from approximately east northeast to east before turning southeast to track towards ACO. Specifically, Runway 06L departures range from the northeast (an area south of US-322 and west of SR-8) to the east (an area west of I-77 and north of I-480), before turning southeast towards ACO. Runway 06R departures tend to range from the east (an area south of SR-17 and northwest of US-42) to the southeast (an area approximately 1 mile east of I-77 and northwest of US-42), before turning southeast towards ACO.

Runway 24L and 24R departures towards ACO depart a primarily southern heading before turning towards the southeast to track towards ACO. Specifically, Runway 24L departures tend to head south and once approximately 5 miles south of the airport turn southeast towards ACO, roughly paralleling I-80. Runway 24R departures tend to head even further south towards Brunswick, OH before turning east southeast towards ACO.

#### C.3.2.1.4 CLE No Action Airspace Alternative – APE (South) Departures (06L/24R and 06R/24L)

Note that there are no changes from the No Action Airspace Alternative to the MASE Airspace Redesign Alternative for APE departures.

The Appleton VORTAC NAVAID (APE) is located approximately 95 miles south southwest of CLE, just 5 miles east of Johnstown, OH and approximately 20 miles northeast of Columbus,

OH in Licking County. Runway 06L and 06R departures towards APE depart these runways towards the east northeast before arcing from the east towards the south southwest towards APE. These 06L and 06R right turn only departures to APE depart in the direction of I-71 towards the northeast, and wrap around from the east towards the southwest anywhere from Cuyahoga Heights crossing over I-480 heading towards Parma, OH and then on to APE.

Runway 24L and 24R departures towards APE depart these runways from the runway southwesterly headings dispersed towards APE through southerly headings that are eventually turned southwest tracking towards APE. These 24L and 24R departures to APE are dispersed over a swath of airspace from southwest of CLE near North Eaton, OH, through south of CLE near Brunswick, OH striking an approximate 10 mile arc from the airport. Aircraft flying more southerly headings tend to fly approximately 10 to 15 miles from the airport before turning direct towards APE.

#### C.3.2.1.5 CLE No Action Airspace Alternative – MFD (Southwest) Departures (06L/24R and 06R/24L)

Note that there are changes from the No Action to the MASE Airspace Redesign Alternative. There is a change in MFD departures that would in the future depart over the OBRLN and ARMST departures fixes in the MASE Airspace Redesign Alternative.

The Mansfield VORTAC NAVAID (MFD) is located approximately 55 mile southwest of CLE, approximately 3 miles south, southeast of Shelby, OH and 5 miles southwest of Mansfield, OH in Richland County, OH. Runway 06L and 06R departures towards MFD depart these runways towards the east northeast before arcing from east to southwest towards MFD. These 06L and 06R primarily right turn departures to MFD depart in the direction of I-71 towards the northeast, and wrap around tightly from the east to the southwest anywhere from Brooklyn crossing over I-480 towards Parma Heights and then on to MFD. Along this southwesterly heading towards MFD some aircraft are vectored towards the west anywhere from 20 to 50 miles from CLE. In a few instances some of these Runway 06L and 06R departures towards MFD will turn left and wrap around from the north to the southwest, although almost all these are turboprop aircraft.

Runway 24L and 24R departures towards MFD depart these runways from the runway southwesterly headings tracking towards MFD through primarily direct southwesterly headings. Some turboprops from these runways are turned on a more westerly heading. Somewhat similar to the 06L and 06R MFD departures, a few aircraft are vectored towards the west anywhere from 30 to 50 miles from CLE along this southwesterly heading towards MFD.

#### C.3.2.1.6 CLE No Action Airspace Alternative – SKY (West) Departures (06L/24R and 06R/24L)

There is a change in transitioning from CLE through CRL for points west of DTW versus the MASE Airspace Redesign Alternative.

The Sandusky VOR/DME NAVAID (SKY) is located in Erie County, OH on the Griffing Sandusky Airport approximately 42 miles west of CLE. Runway 06L and 06R departures towards SKY depart these runways towards the east northeast before arcing from the north of CLE to the west towards SKY. These 06L and 06R left turn departures to SKY depart in the

direction of Lake Erie towards the north, and wrap around towards the west with the primary flow along the Lake Erie shoreline or over land between Bay Village, OH and Lorain, OH before heading out over Lake Erie towards SKY. From SKY these flights typically transition west towards the Waterville VOR/DME NAVAID (VWV), located south of Toledo, OH (west of I-75 and south of SR-582) in Wood County, OH, or transition to the FILUP fix, located a few miles south of SR-2 in Ottawa County, OH not more than 5 miles from the Lake Erie shoreline, before heading further west. Alternately, a few flight paths transition from SKY to the northwest between the FILUP fix and the Carleton VORTAC (CRL), located approximately 13 miles south southwest of DTW in Monroe County, MI.

Runway 24L and 24R departures towards SKY depart these runways from the runway southwesterly headings tracking towards SKY after turning right through a more westerly heading of approximately 265 degrees. At approximately 10 miles west of the airport these flights are tracking between I-90 and I-80 between SR-83. Westerly and northwesterly transitions from SKY are the same as those described for the 06L and 06R departures. In the MASE alternative these departures use a westerly departure heading of approximately 280 degrees with the majority of aircraft tending to fly more towards I-90 at 10 miles from CLE.

Note that in the MASE Alternative the only departures going over WEEDA would be DTW arrivals. All others departures in this west to northwest departure corridor would go SKY to ALPHE (ALPHE1 SID) or SKY to CRL (CRL transition on AMRST1 SID).

#### C.3.2.1.7 CLE No Action Airspace Alternative – CETUS and JUNKR (Northwest) Departures (06L/24R and 06R/24L)

There are changes from the No Action to the MASE Airspace Redesign Alternative in that the CETUS and JUNKER departures (to DTW & DTW satellites) become GEMNI and LLEEO CLE Departures (to DTW and DTW Satellites) in the MASE Airspace Redesign Alternative.

DTW and DTW satellite departures from CLE use either the CETUS or JUNKR departure fixes. The CETUS departure fix is located approximately 55 miles northwest of CLE over Lake Erie, just south of North Bass Island. The JUNKR departure fix is located approximately 50 miles northwest of CLE over Lake Erie, just north of Pelee Island, Ontario.

Runway 06L and 06R departures towards CETUS and JUNKR depart these runways where higher altitude jet aircraft turn north and head out over Lake Erie approximately between SR-252 and SR-237. Once over Lake Erie, the CETUS bound jets turn west where they are dispersed over a wide swath over the lake (approximately 10 miles) heading northwest toward CETUS. The JUNKR bound jets turn northwest once over Lake Erie and track towards the fix in a fairly compact stream.

Turboprops typically head more towards the northwest after departing 06L and 06R crossing the Lake Erie shoreline anywhere from between SR-83/US-6 and Lorain, OH. The JUNKR bound turboprops track towards the area defined by SR-83/US-6, while the CETUS turboprops track towards the west of this intersection and Lorain, OH.

Runway 24L and 24R departures towards CETUS and JUNKR depart these runways from the runway southwesterly headings and turning right towards a westerly heading for approximately 5

miles to an area north of I-480 in the vicinity of North Ridgeville, OH. In this area the JUNKR departures head northwest crossing the Lake Erie shoreline east of Lorain, OH and heading towards the JUNKR fix. The CETUS departures vary from westerly to west northwest heading crossing the Lake Erie shoreline from between Vermillion, OH to Lorain, OH. Again these CETUS bound jets are dispersed over a wide swath over the lake (approximately 10 miles) heading northwest toward CETUS.

### C.3.3 No Action Airspace Alternative – DTW Arrivals

Detroit (DTW) arrivals for the No Action Airspace Alternative represent a variety of existing procedures for entering DTW airspace to access the primary northeast and southwest runways. Descriptions of these arrival procedures will provide context when describing the proposed alternative airspace design changes.

Fixes comprising Detroit arrivals reflect the following high-level attributes when comparing the No Action Airspace Alternative and the MASE Alternative

- CETUS is the primary arrival fix located southeast of DTW. GEMNI and WEEDA are new parallel arrival fixes south and east of DTW. GEMNI will replace the CETUS arrival fix. WEEDA is a new arrival fix and will include traffic from both MIZAR and CETUS.

- SPICA is a northeasterly arrival fix that does not change.

- POLAR is the north and northwest arrival fix that does not change

- MIZAR is the southwest arrival fix with some traffic transitioned to WEEDA

Note that while the primary arrival and departure runways are the northeast and southwest runways 04L/22R, 04R/22L, 03L/21R, and 03R/21L during certain meteorological conditions of wind speed and direction or airport maintenance considerations, the east and west runway configurations of 09L-09R and 27L-27R are used. These particular configurations are used rarely, but have been included in the noise modeling and analysis to represent the historical percentage of time these operations occur.

#### C.3.3.1 Overview of the No Action Airspace Alternative - DTW Arrivals

**DTW Arrivals to the Northeast Runways 04L-04R and 03L-03R**

Arrivals to Runways 04L-04R & 03L-03R at DTW originate from a number of nodal points surrounding DTW airspace. Arrivals from the east and northeast arrive over the SPICA fix located in Ontario, Canada on the northern shore of Lake St. Clair. Arrivals from the south and southeast arrive over the CETUS aeronautical fix located over Lake Erie just south of North Bass Island, and between this island and Middle Bass Island. Arrivals from the southwest and west come into DTW airspace over the MIZAR aeronautical fix. This arrival point is located in north central Lenawee County, MI, approximately 1 mile north of Fairfield, MI. North and northwesterly arrivals come into DTW terminal airspace over the POLAR arrival fix. This

arrival fix is located in southeast Genesee County, MI, approximately 1 to 2 miles north of Fenton, MI, (adjacent to US-23).

**DTW Arrivals to Southwest Runways 22L-22R and 21L-21R**

The 22L-22R & 21L-21R southwest arrivals use the same arrival fixes as the northeast runways 04L-04R & 03L-03R.

#### C.3.3.1.1 DTW No Action Airspace Alternative – SPICA (Northeast) Arrivals (All Northeast and Southwest Runways)

Note that there are minor changes from the No Action Airspace Alternative to the MASE Airspace Redesign Alternative for SPICA arrivals in that some existing CETUS (becomes GEMNI) traffic is routed over SPICA.

The SPICA fix is located in Ontario, Canada on the northern shore of Lake St. Clair. The SPICA arrivals to the southwest runways (22L-22R & 21L-21R) arrive at SPICA fix where they are vectored to the southwest to an area over Lake St. Clair approximately 2.5 miles east of the Detroit shoreline (VERNR fix). At this point, aircraft are either vectored directly southwest to for a left turn for a final approach for one of the southwest runways, or vectored in a range of headings from west northwest to west in a base leg for the southwest runways. From the direct southwest heading to final or from the west northwest to west in a base leg to final routing, the aircraft are aligned with the appropriate southwest runway (22L-22R & 21L-21R) typically from 8 to 20 miles from the DTW. Geographically referenced, the turn to final for the southwest runways occurs anywhere between Oak Park, MI and Dearborn Heights, MI from the VERNR transition, or secondary arrival fix.

The SPICA arrivals to the northeast runways (04L-04R & 03L-03R) arrive at SPICA fix where they are vectored to the southwest to an area between I-94 and I-75 (near the WITKR fix), approximately 10 miles northeast of DTW. Aircraft typically bound for east side northeast DTW runways (03L and 03R) turn south southwest on a downwind leg, and will fly this leg once abeam of the airport for 7 to 20 miles depending on traffic volume before turning a right base and eventual right final for a northeast runway. Geographically, this path is 3 to 4 miles southeast of the airport and parallel to the primary runways. Abeam of the airport, these aircraft are west of I-75 near US-24. They may turn a base leg before the Huron River, or continue as far southwest as US-50 before turning a base leg to a final leg depending on traffic volume.

Aircraft typically bound for west side northeast DTW runways (04L and 04R) turn west on an crosswind leg, and will fly this leg to a point approximately in the area south of US-12 and east of I-275 before turning southwest and paralleling the west side northeast DTW runways (04L and 04R). As on the east side of DTW, these aircraft will fly this leg once abeam of the airport for 7 to 20 miles depending on traffic volume. After the appropriate distance these aircraft will turn a left base and eventual left final for a northeast runway. Geographically, this path is 3 to 4 miles northwest of the airport and parallel to the primary runways. Abeam of the airport, these aircraft are crossing I-275 and I-94 from northeast to southwest. They may turn a base leg around Roulo, MI, or continue as far southwest as London, MI before turning a base leg to a final leg depending on traffic volume.

#### C.3.3.1.2 DTW No Action Airspace Alternative – CETUS (Southeast) Arrivals (All Northeast and Southwest Runways)

There are changes from the No Action to the MASE Airspace Redesign Alternative in that GEMNI replaces CETUS and the new arrival fix WEEDA is added further south and west of GEMNI.

The CETUS fix is located over Lake Erie just south of North Bass Island, and between this island and Middle Bass Island. The CETUS arrivals to the southwest runways (22L-22R & 21L-21R) arrive at CETUS fix where they are vectored directly towards DTW. At approximately 10 miles from DTW on the southeast boundary, aircraft are either sent north northeast for the east side DTW runways (21L and 21R), or northwest for the west side runways (22L and 22R).

East side DTW runway arrivals (21L and 21R) from CETUS proceed north northeast paralleling these runways and turn a left base leg prior to final anywhere from approximately 5 to 20 miles from the DTW depending on traffic volume. Geographically, this path is 3 to 4 miles east of the airport and parallel to the primary runways. Abeam of the airport, these aircraft are west of I-75 and over fly I-94 (between SR-39 and US-12). They may turn a base leg near Dearborn, MI, or continue as far northeast as SR-102 before turning a base leg to a final leg (in the area of Oak Park, MI) depending on traffic volume.

West side DTW runway arrivals (22L and 22R) from CETUS proceed northwest before turning north northeast paralleling these runways. These aircraft turn a right base leg prior to final anywhere from approximately 10 to 20 miles from the DTW depending on traffic volume. Geographically, this path is 3 to 4 miles west and north of the airport and parallel to the primary runways. Abeam of the airport, these aircraft are over I-275 and south of US-12). They may turn a base leg anywhere from Dearborn Heights, MI to Livonia, MI, or continue as far northeast as I-695 before turning a base leg to a final leg (in the area of Oak Park, MI) depending on traffic volume.

All arrivals to northeast runways (04L-04R & 03L-03R) are vectored to a point approximately 25 miles southeast of DTW over Lake Erie, and then to a point 8 to 12 mile southeast of the airport. Aircraft for 04L and 04R are then vectored north northwest to intersect the base leg for these west side runways. Aircraft for 03L and 03R are vectored north northwest to intersect a base leg for the east side runways.

#### C.3.3.1.3 DTW No Action Airspace Alternative – MIZAR (Southwest) Arrivals (All Northeast and Southwest Runways)

Note that there are minimal changes from the No Action Airspace Alternative to the MASE Airspace Redesign Alternative for MIZAR arrivals in that some of these arrivals are transitioned to WEEDA.

The MIZAR aeronautical fix is located in north central Lenawee County, MI, approximately 1 mile north of Fairfield, MI, and approximately 45 miles southwest of DTW. The MIZAR arrivals to the southwest runways (22L-22R & 21L-21R) arrive at the MIZAR fix where they are vectored to the northeast to an area in the vicinity of Larsen Airpark, west southwest of Roulo, MI. At this point, aircraft are either vectored northeast for an eventual right turn for a base leg

and another right turn for a final approach for one of the DTW west side southwest runways (22L-22R), or vectored east for an downwind leg for one of the DTW east side southwest runways (21L-21R).

The DTW west side MIZAR arrivals fly to an area that is abeam of DTW approximately equidistant from DTW as from Willow Run Airport (YIP), in an area a few miles west of the confluence of I-275 and I-94. From this point these aircraft head north northeast on a downwind leg and turn to a right base leg anywhere from Dearborn Heights, MI to Livonia, MI, outwards to Oak Park, MI and sometimes beyond depending on traffic volume. Traffic then turns right towards the south southeast to align with one of the DTW west side southwest runways (22L-22R).

The DTW east side MIZAR arrivals are vectored from the area in the vicinity of Larsen Airpark, west southwest of Roulo, MI to the east where they are turned left towards the north northeast, about 1 mile west of US-24 approximately near Sibley Rd. This turn towards a left downwind for one of the DTW east side southwest runways (21L-21R) parallels the Detroit River a few miles to the east. Traffic will make a left turn from the downwind leg to the base leg anywhere from Dearborn, MI out to Highland Park, MI and beyond depending on traffic volume. Traffic then turns left towards the south southeast to align with one of the DTW east side southwest runways (21L-21R).

The MIZAR arrivals to the northeast runways (04L-04R & 03L-03R) arrive at the MIZAR fix where they are either vectored to the east northeast to an area approximately 5 miles south of Milan, MI (near US-23), or vectored more northeast to an area north of SR-50 (east of Tecumseh, MI), and then east towards the area previously identified that is south of Milan, MI. Note that aircraft are dispersed between these two general areas when being vectored to an approximate 20 mile outer posting area for alignment with one of the northeast runways (04L-04R & 03L-03R). At approximately 10 miles from DTW on the southwest side of the airport, these northeast MIZAR arrivals to the northeast runways (04L-04R & 03L-03R) range from Sumpter Rd. on the western periphery to Exeter Rd on the eastern periphery.

#### C.3.3.1.4 DTW No Action Airspace Alternative – POLAR (North) Arrivals (All Northeast and Southwest Runways)

Note that there are no changes from the No Action Airspace Alternative to the MASE Airspace Redesign Alternative for POLAR arrivals.

The POLAR aeronautical fix is located in southeast Genesee County, MI, between 1 and 2 miles north of Fenton, MI, (adjacent to US-23), and approximately 47 miles north northwest of DTW. The POLAR arrivals to the southwest runways (22L-22R & 21L-21R) arrive at the POLAR fix where they are vectored to the south southeast to an area that is slightly north of Milford, MI. At this point, aircraft are vectored further southeast for an eventual left turn to a base leg and right turn for a final approach for one of the DTW southwest runways (22L-22R & 21L-21R).

The left turn to a base leg for these DTW southwest runway (22L-22R & 21L-21R) POLAR arrivals, can occur from anywhere between approximately 15 to 25 miles north and slightly west of DTW. This divergence on one end of the spectrum spans an area from approximately Walled

Lake, MI, south and east through Livonia, MI, with a right turn towards the southwest runways (22L-22R & 21L-21R) northeast of Dearborn Heights to Dearborn, MI. On the other end of the spectrum these aircraft can range from Walled Lake, MI, south and east through Farmington, Oak Park and Highland Park MI, with the right turn towards the southwest runways (22L-22R & 21L-21R) even further northeast of Dearborn Heights to Dearborn, MI.

The POLAR arrivals to the northeast runways (04L-04R & 03L-03R) arrive at the POLAR fix where they are vectored to the southeast to an area approximately 10 miles north northwest of DTW, near I-275 and a couple of miles east of Canton-Plymouth Mettetal Airport. At this point, aircraft are either vectored southeast for an eventual right turn for a downwind leg and another right turn for base leg then another right turn towards final for one of the DTW east side northeast runways (03L-03R), or vectored south towards a point in an area that is abeam of DTW approximately equidistant from DTW as from Willow Run Airport (YIP), in an area a few miles west of the confluence of I-275 and I-94. From this area, aircraft are vectored south southwest for a downwind leg to one of the DTW west side northeast runways (04L-04R).

The DTW east side POLAR arrivals fly to an area that is abeam of DTW, where these aircraft are approximately west of I-75 near US-24. They may turn a base leg before the Huron River, or continue as far southwest as US-50 (northwest of Monroe, MI) before turning a base leg before turning towards a final leg for one of the DTW east side northeast runways (03L-03R) depending on traffic volume.

The DTW west side POLAR arrivals are vectored from an area that is abeam of DTW approximately equidistant from DTW as from Willow Run Airport (YIP), in an area a few miles west of the confluence of I-275 and I-94. These aircraft are then vectored southwest and parallel the west side northeast DTW runways (04L and 04R). As on the east side of DTW, these aircraft will fly this leg once abeam of the airport for 7 to 20 miles depending on traffic volume. These aircraft will then turn a left base and eventual left final for a northeast runway. Geographically, this path is 3 to 4 miles northwest of the airport and parallel to the primary runways. Abeam of the airport, these aircraft are crossing I-275 and I-94 from northeast to southwest. They may turn a base leg around Roulo, MI, or continue as far southwest as London, MI before turning a base leg to a final leg depending on traffic volume.

### C.3.4 No Action Airspace Alternative - DTW Departures

Detroit (DTW) departures for the No Action Airspace Alternative represent a variety of existing procedures exiting DTW airspace once departing from the primary northeast and southwest runways. Descriptions of these departure procedures will provide context when describing the proposed alternative airspace design changes.

Fixes comprising Detroit departures reflect the following high-level attributes when comparing the No Action Airspace Alternative and the MASE Alternative.

- The existing WINGS departure fix would be replaced by the MAARS departure fix in the MASE Alternative Airspace Design.

- The existing TYCOB departure fix would be replaced by the ERRTH departure fix in the MASE Alternative Airspace Design.

- The very limited existing HADAR departure fix usage would be replaced by the MOONN departure fix in the MASE Alternative Airspace Design for those limited low altitude HADAR propeller departures.

- Some traffic would be moved from the existing DUNKS departure fix to the EARVN departure fix.

Note that while the primary arrival and departure runways are the northeast and southwest runways 04L/22R, 04R/22L, 03L/21R, and 03R/21L during certain meteorological conditions of wind speed and direction or airport maintenance considerations, the east and west runway configurations of 09L-09R and 27L-27R are used. These particular configurations are used rarely, but have been included in the noise modeling and analysis to represent the historical percentage of time these operations occur.

### C.3.4.1 Overview of No Action Airspace Alternative – DTW Departures

**DTW Departures from the Northeast Runways 04L-04R and 03L-03R**

Departures from Runways 04L-04R & 03L-03R at DTW depart to a number of nodal points surrounding DTW airspace. Departures towards the north through the north gate depart over the LAYNE aeronautical departure fix located in southwest Lapeer County, MI. Departures towards the north and northeast through the north gate from DTW also depart over the PISTN aeronautical departure fix located in southeast Lapeer County, MI.

Departures towards the east through the east gate depart over the TYCOB aeronautical departure fix located in Ontario, Canada between Lake St. Clair and Lake Erie, approximately 1 mile south of Tilbury, Ontario. Departures to the east and southeast of the east gate also depart through the WINGS aeronautical departure fix located in Ontario, Canada adjacent to Lake Erie, approximately 5 miles east of Learnington, Ontario. Low altitude propeller departures to the east and northeast of the east gate also depart through the HADAR aeronautical departure fix located in Ontario, Canada over Lake St. Clair, approximately 13 miles west of Chatham, Ontario.

Departures towards the southeast, south and southwest depart through the south gate over the SCORR, CAVVS and ANNTS aeronautical departure fixes respectively. The SCORR aeronautical departure fix is located in eastern Lucas County, OH approximately 6-7 miles east of Toledo, OH and less than 2 miles from the Lake Erie shoreline. The CAVVS aeronautical departure fix is located in Toledo, OH (central Lucas County, OH) adjacent to I-75, less than 1 mile north of the interchange of I-75 and I-475. The ANNTS aeronautical departure fix is located in north western Lucas County, OH less than 5 miles west of the I-475 and US-23 interchange, and less than 3 miles south of the OH and MI border.

Departures towards the west, southwest and northwest depart through the west gate over the HARWL and DUNKS aeronautical departure fixes. The HARWL aeronautical departure fix is located in eastern Jackson County, MI, south of I-94 and less than 10 miles east of Jackson, MI.

The DUNKS aeronautical departure fix is located in southeast Ingham County, MI and west of SR-52, adjacent to the Ingham County and Jackson County, MI border.

**DTW Departures from the Southwest Runways (22L-22R and 21L-21R)**

The 22L-22R & 21L-21R southwest runway departures use the same departure fixes as the northeast runways 04L-04R & 03L-03R. An exception is that west gate departures will use the EARVN departure fix located in southeast Ingham County, MI, adjacent to SR-52/SR-36, near White Oak, MI for Minneapolis (MSP), Milwaukee (MKE), Grand Rapids (GRR) and Green Bay (GRB) DTW departures in the MASE Airspace Redesign Alternative.

#### C.3.4.1.1 No Action Airspace Alternative – DTW North Gate Departures (LAYNE and PISTN) from the DTW Northeast Runways (04L-04R and 03L-03R)

Note that there are no changes from the No Action Airspace Alternative to the MASE Airspace Redesign Alternative for North Gate departures from northeast runways.

The west side DTW runways (04L and 04R) use primarily the LAYNE departure fix for north and northwest departures, while the east side runways (03L and 03R) use primarily the PISTN departure fix for north and northeast departures.

The west side runway departures fly due north over Livonia, Farmington and Pontiac, when departing towards the LAYNE fix. A few turboprop departures from these northeast runways will first fly northeast towards I-96, before turning direct towards LAYNE.

The east side runway departures fly slightly north northeast before turning north towards the PISTN fix. These flights fly towards the I-696 and I-75 interchange before turning north towards PISTN.

#### C.3.4.1.2 No Action Airspace Alternative – DTW North Gate Departures (LAYNE and PISTN) from the DTW Southwest Runways (22L-22R and 21L-21R)

Note that there are no changes from the No Action Airspace Alternative to the MASE Airspace Redesign Alternative for North Gate departures from southwest runways.

The west side DTW runways (22L and 22R) use primarily the LAYNE departure fix for north and northwest departures, while the east side runways (21L and 21R) use primarily the PISTN departure fix for north and northeast departures.

The west side runway departures fly southwest towards Martinsville, MI, then northwest over Ann Arbor then north northeast when departing towards the LAYNE fix. A few turboprop departures from these southwest runways will first fly west towards YIP, before turning direct towards LAYNE.

The east side runway departures fly south towards West Rd., then turn southeast towards I-75, then northeast towards the Detroit River (between Detroit and Windsor) before turning north headed towards the PISTN fix.

#### C.3.4.1.3 No Action Airspace Alternative – DTW East Gate Departures (TYCOB and WINGS) from the DTW Northeast Runways 04L-04R and 03L-03R

Note that there are changes from the No Action to the MASE Airspace Redesign Alternative. In the MASE Airspace Redesign Alternative, ERRTH replaces TYCOB, MARRS replaces WINGS, and MOONN replaces HADAR as major new departure fix. (which is a satellite arrival fix and sometimes used for DTW & Satellite Turboprop Departures today)

The northeast DTW runways (04L-04R & 03L-03R) depart for the TYCOB and WINGS DTW East Gate departures fixes with primarily a northeast departure heading, and sometimes an east and east, southeast departure heading. The northeast departure headings span from Dearborn Heights to south Dearborn, MI, where the more northerly tracks turn east southeast towards TYCOB and the more southerly tracks turn southeast towards WINGS. The east departure headings off of these northeast DTW runways (04L-04R & 03L-03R) head east until approximately 10 miles from the airport in the area around Lincoln Park, MI where they head northeast under the previously described TYCOB and WINGS flows. The east southeast flow from these northeast DTW runways (04L-04R & 03L-03R) head east southeast to a point in the vicinity of Riverview, MI towards Grosse Ile, and then direct to the WINGS departure fix.

#### C.3.4.1.4 No Action Airspace Alternative – DTW East Gate Departures (TYCOB and WINGS) from the DTW Southwest Runways (22L-22R and 21L-21R)

Note that there are changes from the No Action to the MASE Airspace Redesign Alternative. In the MASE Airspace Redesign Alternative, ERRTH replaces TYCOB, MARRS replaces WINGS, and MOONN replaces HADAR (which is a satellite arrival fix and sometimes used for DTW & Satellite Turboprop Departures today)

The southwest DTW runways (22L-22R & 21L-21R) depart for the TYCOB and WINGS DTW East Gate departures fixes with primarily a southern departure heading, and an east southeast departure heading. The southern departure headings span from east of Willow, MI and north of Waltz, MI then in a southeast heading towards South Rockwood, on the south side of the main flow, to north and east of Willow Metro Park then towards the southeast in the vicinity of I-75, north and east of Rockwood, MI. Where these more northerly tracks turn southeast towards I-75 (north and east of Rockwood MI) a portion of these tracks subsequently head direct to TYCOB. Where the more central and southwest flow of traffic occurs (east of Willow, MI and north of Waltz, MI then in a southeast heading towards South Rockwood on the south side of the main flow), these track head primarily towards the WINGS fix. In addition some even further southerly tracks from southwest DTW runways (22L-22R & 21L-21R) departures head as far south as the area proximate to Wickenheiser Airport before turning towards the east and then towards WINGS.

The east southeast departure headings off of these southwest DTW runways (22L-22R & 21L-21R) have both high altitude jet and lower altitude turboprop and propeller traffic that head east southeast between the areas bounded by Riverview, MI and Woodhaven, MI where they then head east northeast towards TYCOB, or east southeast towards WINGS.

#### C.3.4.1.5 No Action Airspace Alternative – DTW South Gate Departures (SCORR, CAVVS and ANNTS) from the DTW Northeast Runways (04L-04R and 03L-03R)

Note that there are changes from the No Action to the MASE Airspace Redesign Alternative in that jets would use the SCORR fix in the MASE Airspace Alternative. The northeast DTW runways (04L-04R & 03L-03R) depart all runways for the south gate departures fixes (SCORR, CAVVS and ANNTS). ANNTS and CAVVS departures towards the west (i.e., left turn off the runways). The SCORR and CAVVS departures depart towards the east (i.e., right turn off the runways). Note that SCORR is the primary turboprop and propeller route for this particular configuration. The DTW northeast Runways 04L-04R & 03L-03R west side (left turn) runway departures head initially north northwest between Westland, MI and Garden City MI, where they turn northwest and cross I-275 south and west of Plymouth, MI., before turning to the west southwest towards Frain Lake, MI. From this point aircraft are sent due south towards the west side of Willow Run, MI with one flow diverging due south towards CAVVS and the other flow diverges slightly towards the south southwest from Frain Lake, MI direct towards ANNTS.

The DTW northeast Runways 04L-04R & 03L-03R east side (right turn) runway departures head initially northeast toward Dearborn MI, where they transition from the east to the south southwest roughly paralleling the I-75 corridor towards the Gross Ile Municipal Airport where they diverge to either the SCORR or CAVVS fixes.

#### C.3.4.1.6 No Action Airspace Alternative – DTW South Gate Departures (SCORR, CAVVS and ANNTS) from the DTW Southwest Runways (22L-22R and 21L-21R)

Note that there are changes from the No Action to the MASE Airspace Redesign Alternative.

The southwest DTW runways (22L-22R & 21L-21R) have aircraft that depart all runways for the south gate departures fixes (SCORR, CAVVS and ANNTS) toward the southwest and southeast (i.e., straight out departures or left turns off the runways). Note again that as in the northeast runway departures, the SCORR fix is the primary turboprop and propeller route for this particular configuration.

The southwest DTW 22L-22R & 21L-21R ANNTS runway departures fly basically the runway heading towards the fix. CAVVS runway departures in this configuration head slightly more south southeast, although some aircraft transition from the initial ANNTS headings towards CAVVS anywhere from 5 to 13 miles from DTW. One group of SCORR departures in this configuration turn towards the left heading south to south southeast in flying towards the fix. Another group of SCORR departures head southeast from the airport toward the GLOZE (transition) fix, located west of I-75 and south of Van Horn Rd. These flights then turn south southwest towards the SCORR fix

#### C.3.4.1.7 No Action Airspace Alternative – DTW West Gate Departures (HARWL, DUNKS and EARVN) from the DTW Southwest Runways (22L-22R and 21L-21R)

Note that there are changes from the No Action to the MASE Airspace Redesign Alternative. In the MASE Airspace Redesign Alternative the MSP, MKE, GRR and GRB move from DUNKS to EARVN.

The southwest DTW runways (22L-22R & 21L-21R) depart primarily 21L and 21R for HARWL, and depart primarily 22L and 22R for DUNKS. While there are exceptions to this general procedure, keeping these departures separated during time periods of high west gate departure volume, keeps controllers from having to cross HARWL and DUNKS departure traffic.

The southwest (22L and 22R) primarily jet flow travels towards an area south and east of Roulo, MI before turning northwest towards the DUNKS departure fix, flying over Ann Arbor, MI. The west (22L and 22R) primarily turboprop or propeller flow tracks parallel to I-94 where these aircraft turn northwest in an area just south and east of Willow Run Airport (YIP) and head towards DUNKS passing over Ann Arbor, MI at a lower altitude than the jets. Note that between these two primary (22L and 22R) flight tracks to DUNKS there can be a number of flights dispersed on intermediary tracks between these two main routes, as well as those flights that track further north and over fly YIP to DUNKS.

The DTW east side runway (21L and 21R) HARWL departures head southwest off the runway(s), where this flow tracks south and east of Martinsville MI, where they turn west northwest and cross US-23 flying over Saline, MI., en route towards HARWL.

The EARVN departures follow primarily the same flight track as the DUNKS departures, but diverge towards EARVN just south and east of South Lyon, MI.

#### C.3.4.1.8 No Action Airspace Alternative – DTW West Gate Departures (HARWL, DUNKS and EARVN) from the DTW Northeast Runways (04L-04R and 03L-03R)

Note that there are changes from the No Action to the MASE Airspace Redesign Alternative. In the MASE Airspace Redesign Alternative the MSP, MKE, GRR and GRB move from DUNKS to EARVN.

The northeast DTW runways (04L-04R & 03L-03R) depart primarily 03L and 03R for DUNKS, and depart primarily 04L and 04R for HARWL. While there are exceptions to this general procedure, keeping these departures separated during time periods of high west gate departure volume, keeps controllers from having to cross HARWL and DUNKS departure traffic.

The DTW west side runways (04L and 04R) HARWL departures head north off the runway to an area north of SR-153 where they turn northwest towards Plymouth, MI, crossing I-275 before turning west southwest towards HARWL aeronautical departure fix.

The DTW east side runways (03L and 03R) flow over Garden City, MI crossing over Hines Drive and turning in a northwesterly trajectory towards South Lyon, MI and then west towards DUNKS.

The EARVN departures follow primarily the same flight track as the DUNKS departures, but diverge towards EARVN just west of Ypsilanti, MI.

## C.4 MASE ALTERNATIVE AIRSPACE REDESIGN (PROPOSED ACTION AND PREFERRED ALTERNATIVE)

### C.4.1 MASE Alternative Airspace Redesign - Routing Descriptions

Descriptions of the MASE Airspace Redesign Alternative will be done mainly on the basis of describing those attributes of the airspace redesign that vary from the No Action Airspace Alternative. This approach will avoid unnecessary duplication in describing those attributes of both designs that are common, as well as aid in more focused concentration on those items that represent changes between the No Action Airspace Alternative and the MASE Airspace Redesign Alternative.

### C.4.2 MASE Airspace Redesign Alternative - CLE Arrivals

Cleveland (CLE) arrivals for the MASE Airspace Redesign Alternative represent a variety of modified procedures for entering CLE airspace to access the primary northeast and southwest runways. The description of these arrival procedures has been done on an exception basis, describing mainly those aspects of the MASE design that have changed from the No Action Airspace Alternative. With this approach specific runway use descriptions, as was done for the No Action alternative have been abandoned and the descriptions focus mainly on the changes between the two alternatives.

NAVAIDS and Fixes comprising Cleveland arrivals reflect the following high-level attributes when comparing the MASE Alternative Airspace Redesign and the No Action Airspace Alternative.

- HIMEZ replaces GONNE, the existing north arrival fix for CLE in the MASE Alternative
- The existing Chardon (CXR) VOR/DME NAVAID and KEATN fix continue to function as arrival points for CLE in both the MASE Alternative Airspace Redesign and No Action Airspace Design Alternatives.
- The existing Mansfield (MFD) VORTAC NAVAID is replaced with by the ABERZ fix, thereby making room for two new additional departure fixes to the northwest (ARMST & OBRLN), and requiring the WAKEM arrival fix use to be discontinued (WAKEM arrivals are rerouted in an approximate split between HIMEZ (VWV-WAKEM, 60%) and ABERZ (ROD-WAKEM, 40%).

In the MASE Alternative Airspace Redesign, new arrivals enter via the ABERZ (Southwest) fix and the new HIMEZ (North) fix, as opposed to the No Action Airspace Design WAKEM

(Southwest) arrival fix. The WAKEM arrival fix was abandoned to free-up airspace to facilitate the establishment of the new AMRST and OBRLN departure fixes. Arrivals formerly transiting WAKEM are now apportioned between ABERZ and HIMEZ.

### C.4.2.1 Overview of the MASE Airspace Alternative - CLE Arrivals

Arrivals to all runways at CLE will continue to originate from many of the same nodal points surrounding CLE airspace as described in the No Action Airspace Alternative. Arrivals from the east and northeast will continue to arrive over the Chardon VOR/DME NAVAID (CXR) located in central Geauga County, OH, near Chardon, OH. Arrivals from the south and southwest arrive over the KEATN aeronautical fix located in northeast Wayne County, OH, approximately 3 miles southeast of Doylestown, OH.

Arrivals from the southwest and west would no longer enter CLE airspace over the WAKEM aeronautical fix, located in southeast Huron County, OH. Instead traffic will be shifted to ABERZ and HIMEZ in the MASE Alternative Airspace Redesign. The ABERZ (Southwest) fix is located approximately 46 miles southwest of CLE in northeast Richland County, OH.

#### C.4.2.1.1 CLE MASE Airspace Alternative – HIMEZ (North) Arrivals

Changes in the MASE Airspace Redesign Alternative from the No Action Airspace Alternative would be realized in that arrivals from the north to CLE would arrive at the HIMEZ arrival fix as opposed to the GONNE arrival fix.

The primary effect of this shift from GONNE to HIMEZ is that the primary backbone flows are shifted approximately 3 to 4 miles to the southwest over Lake Erie prior to arriving in the CLE ATCT airspace where there are no changes to arrival flight tracks.

#### C.4.2.1.2 CLE MASE Airspace Redesign Alternative – CXR (East) Arrivals

There are no changes from the No Action Airspace Alternative to the MASE Airspace Redesign Alternative for Cleveland arrivals arriving from the northeast and east over the Chardon VOR/DME NAVAID (CXR) located in central Geauga County, OH, near Chardon, OH.

#### C.4.2.1.3 CLE MASE Airspace Redesign Alternative – KEATN (South) Arrivals

There are no changes from the No Action Airspace Alternative to the MASE Airspace Redesign Alternative for Cleveland arrivals arriving from the southeast and south over the KEATN fix located in northeast Wayne County, OH, approximately 3 miles southeast of Doylestown, OH.

#### C.4.2.1.4 CLE MASE Airspace Alternative – ABERZ (Southwest) Arrivals (Formally WAKEM (West) Arrivals)

Changes in the MASE Airspace Redesign Alternative from the No Action Airspace Alternative would be realized in that the WAKEM fix arrival volume would shift primarily to the new ABERZ (Southwest) fix in the MASE Airspace Redesign Alternative. There is however a change in the WAKEM traffic from VWV and ROD transition NAVAIDS that would be split in an approximate 60/40 ratio between the new HIMEZ and ABERZ fixes respectively.

The primary effect of this shift in traffic from the WAKEM to ABERZ, which is a fix and traffic shift of approximately 23 miles to the south, is that a heavy westerly arrival flow is shifted further south and west of CLE, allowing for greater departure throughput in the area formally occupied by this arrival stream. In addition traffic arriving the northeast runways (06L and 06R), fly a direct path from ABERZ to the final approach for these runways. Arrivals to the southwest runways (24L and 24R) fly straight-in approaches to the downwind legs for these runways, and other characteristics of the runway traffic pattern are identical to the No Action Alternative.

### C.4.3 MASE Airspace Alternative - CLE Departures

Cleveland (CLE) departures for the MASE Airspace Redesign Alternative represent a variety of modified procedures for exiting CLE airspace once departing from the primary northeast and southwest runways. Description of these departure procedures has been done on an exception basis, describing mainly those aspects of the MASE design that have changed from the No Action Airspace Alternative. With this approach specific runway use descriptions, as was done for the No Action alternative have been abandoned and the descriptions focus on only the changes between the two alternatives.

NAVAIDS and Fixes comprising Cleveland departures reflect the following high-level attributes when comparing the No Action Airspace Alternative and the MASE Alternative.

- The existing Akron (ACO) VOR/DME NAVAID, Appleton (APE) VORTAC NAVAID, Sandusky (SKY) VOR/DME NAVAID and the FAILS fix continue to function as departure points for CLE in the MASE Airspace Alternatives. Note that SKY would only be used for low altitude propeller departures, and SKY jets would use ARMST.

- Departures from CLE arriving at DTW and its satellites will use the GEMNI and LLEEO departure fixes (was CETUS and JUNKR fixes in the No-Action Alternative).

- The OBRLN and AMRST departures fixes replace MFD VORTAC NAVAID as a departure point for southwest and west departures in the MASE Alternative. The existing Mansfield (MFD) VORTAC NAVAID starts to function as an Arrival Transition to the ABERZ STAR arrival point (along with the new ABERZ fix).

- The traffic that used to depart SKY to VWV now goes AMRST1 VWV transition.

- The LLEEO fix will be used for intra-study CLE departures (i.e., CLE departures to destinations within the study area) in the MASE Alternative. In the No Action Alternative, the CLE intra-study departures are sent over the GILLS fix

#### C.4.3.1 Overview of MASE Airspace Alternative - CLE Departures

Departures from the Runways at CLE initiate their egress from a number of nodal points surrounding CLE airspace. Intra study departures to the northwest depart over the LLEEO fix located approximately 51 miles northwest of CLE and slightly north of Pelee Island, Ontario in Lake Erie. These flights were formally sent over the GILLS fix located approximately 27 miles

due north of Rocky River, OH in the middle of Lake Erie. Note that a number of former No Action Alternative flight tracks were moved from GILLS to FAILS.

Departures to the northeast depart over the FAILS fix located over Lake Erie, approximately 10 miles north of the Willoughby Lost Nation Municipal Airport. The exception to the northeast track applies to those GILLS flights moved to FAILS which track to the northeast before tracking northwest.

Departures to the east and southeast depart over the Akron VOR/DME NAVAID (ACO) located approximately 40 miles southeast of CLE in Portage County, OH, north of I-76 and east of SR-5. Departures to the south and southwest depart over the Appleton VORTAC NAVAID (APE) located approximately 95 miles south southwest of CLE in Licking County, OH, approximately 5 miles east of Johnstown, OH.

Departures to the southwest and west depart either the OBRLN or ARMST departure fixes. The OBRLN departure fix is located approximately 50 miles west southwest of CLE in Huron County, OH, approximately 7 miles southeast of Reedtown, OH (east of SR-4). The ARMST departure fix is located approximately 60 miles west southwest of CLE in northern Seneca County, OH, approximately 10 miles southeast of Fremont, OH. Northwest and west departures use the Sandusky VOR/DME NAVAID (SKY) located in Erie County on the Griffing Sandusky Airport approximately 42 miles west of CLE.

In addition, northwest departures use the GEMNI and LLEEO departure fixes in the MASE Airspace Alternative (No Action Alternative used the CETUS and JUNKR departures fixes). The GEMNI departure fix is located approximately 54 miles northwest of CLE over Lake Erie, just south of North Bass Island. The URSSA departure fix is located approximately 51 miles northwest of CLE over Lake Erie, just north of Pelee Island, Ontario.

#### C.4.3.1.1 CLE MASE Airspace Alternative – GILLS (North) Departures

There are minor changes from the No Action Airspace Alternative to the MASE Airspace Redesign Alternative for CLE departures departing over the GILLS departure fix located over Lake Erie approximately 33miles north of CLE and approximately 80 miles east southeast of DTW. The GILLS departure fix will continue to serve as a low volume departure route for CLE departures to airports north and northwest of the DTW/D21 service area. Some CLE intra-study departures will transition to the LLEEO fix.

#### C.4.3.1.2 CLE MASE Airspace Alternative – FAILS (Northeast) Departures

There are no changes from the No Action Airspace Alternative to the MASE Airspace Redesign Alternative for CLE departures departing over the FAILS departure fix located over Lake Erie approximately 10 miles north of the Willoughby Lost Nation Municipal Airport, and approximately 37 miles northeast of CLE.

#### C.4.3.1.3 CLE MASE Airspace Alternative – ACO (Southeast) Departures

There are no changes from the No Action Airspace Alternative to the MASE Airspace Redesign Alternative for CLE departures departing over the Akron VOR/DME NAVAID (ACO) located in Portage County, OH, east of Akron, OH.

#### C.4.3.1.4 CLE MASE Airspace Alternative – APE (South) Departures

There are no changes from the No Action Airspace Alternative to the MASE Airspace Redesign Alternative for CLE departures departing over the Appleton VORTAC NAVAID (APE) located in Licking County, OH, northeast of Columbus, OH.

#### C.4.3.1.5 CLE No Action Airspace Alternative – MFD (Southwest) Departures

Changes in the MASE Airspace Redesign Alternative from the No Action Airspace Alternative would be realized in that MFD departures would transition to the OBRLN and ARMST departures fixes in the MASE Airspace Redesign Alternative.

By moving the MFD departures to the two new CLE departure fixes (OBRLN and AMRST) further to the northwest there is greater capacity to flush departures from the CLE TRACON to Cleveland Center over two routes as opposed to one route. This effectively eliminates the MFD departure stream, and allows the MFD corridor to be used in conjunction with the new ABERZ fix as a southwest arrival corridor.

#### C.4.3.1.6 CLE MASE Airspace Alternative – SKY (West) Departures

Changes in the MASE Airspace Redesign Alternative from the No Action Airspace Alternative would be realized in that there is a change in transitioning from CLE through CRL for points west of DTW. The only aircraft that will fly from SKY to CRL are props. The preponderance of SKY jet departure traffic flies over AMRST and transitions to CRL or VWV. There would continue to be lower altitude tower en route SKY to VWV transitions in the MASE. Some CLE departures going to TOL would use the SKY NAVAID and transition to the CHOOT fix.

The net effect of using these new SKY MASE flight tracks would be to push CLE departures further south and west from CETUS arrivals (would become GEMNI arrivals in the MASE alternative) and enable better use of the GEMNI and WEEDA fixes for DTW arrivals. The GEMNI fix flights would be used for flights arriving DTW only, while the LLEEO fix would be used for DTW satellite airports only.

#### C.4.3.1.7 CLE MASE Airspace Alternative –GEMNI and LLEEO (Northwest) Departures (Was CETUS and JUNKR in the No Action Alternative)

Changes in the MASE Airspace Redesign Alternative from the No Action Airspace Alternative would be realized in that the CETUS and JUNKR departures (to DTW & DTW satellites) become GEMNI and LLEEO CLE Departures (to DTW and DTW Satellites) in the MASE Airspace Redesign Alternative. A similar shift in flight tracks exists for flights to DTW and FNT when shifting from JUNKR to LLEEO.

The net effect of shifting these flows a very small distance to the northeast from one of the No Action fixes to one of these MASE fixes is to move these flows approximately two miles to the northeast. The changes to these flows between the No Action Airspace Alternative and the MASE Airspace Redesign Alternative effectively take place over Lake Erie, as the CLE departures and DTW and DTW satellite arrival flight paths remain effectively the same.

### C.4.4 MASE Airspace Redesign Alternative - DTW Arrivals

Detroit (DTW) arrivals for the MASE Airspace Redesign Alternative represent a variety of modified procedures for entering DTW airspace to access the primary northeast and southwest runways. Again, description of these arrival procedures has been done on an exception basis, describing mainly those aspects of the MASE design that have changed from the No Action Airspace Alternative. With this approach specific runway use descriptions, as was done for the No Action alternative have been abandoned and the descriptions focus on only the changes between the two alternatives. Note that references to standardized ATC traffic patterns (e.g., downwind, base and final legs) are explained in detail in **Appendix B**.

NAVAIDS and fixes comprising Detroit arrivals reflect the following high-level attributes when comparing the MASE Alternative Airspace Redesign and the No Action Airspace Alternative.

- CETUS is the primary arrival fix located southeast of DTW. GEMNI and WEEDA are new parallel arrival fixes south and east of DTW. GEMNI will replace the CETUS arrival fix. WEEDA is a new arrival fix and will include traffic from both MIZAR and the former CETUS fix.

- SPICA is a northeasterly arrival fix and there are minor changes in that some CETUS traffic has been moved to SPICA.

- POLAR is the north and northwest arrival fix and there are no changes.

- GEMNI is a new fix replacing CETUS

- WEEDA is a new southeast arrival fix for DTW arrivals.

- MIZAR is a southwest arrival fix and there are minor changes in that some MIZAR traffic will be moved to the new WEEDA fix.

- HADAR arrival fix for DTW satellite arrivals is replaced by the PICES fix for DTW satellite arrivals

#### C.4.4.1 Overview of the MASE Airspace Alternative - DTW Arrivals

Arrivals to DTW originate from a number of nodal points surrounding DTW airspace. Arrivals from the east and northeast arrive over the SPICA fix located in Ontario, Canada on the northern shore of Lake St. Clair. Arrivals from the south and southeast arrive over the CETUS aeronautical fix located over Lake Erie just south of North Bass Island, and between this island and Middle Bass Island. Arrivals from the southwest and west come into DTW airspace over the MIZAR aeronautical fix. This arrival point is located in north central Lenawee County, MI,

approximately 1 mile north of Fairfield, MI. North and northwesterly arrivals come into DTW terminal airspace over the POLAR arrival fix. This arrival fix is located in southeast Genesee County, MI, approximately 1 to 2 miles north of Fenton, MI, (adjacent to US-23). The southwest runway arrivals use the same arrival fixes as the northeast runway arrivals at DTW.

#### C.4.4.1.1 DTW MASE Airspace Alternative – SPICA (Northeast) Arrivals

There are no major changes from the No Action Airspace Alternative to the MASE Airspace Redesign Alternative for DTW northeast arrivals arriving over the SPICA arrival fix located in Ontario, Canada on the northern shore of Lake St. Clair. Some former CETUS traffic will be transitioned to SPICA.

#### C.4.4.1.2 DTW MASE Airspace Alternative – HADAR/PICES (Northeast) Arrivals

The existing HADAR fix is replaced by the MOONN fix for DTW departures (HADAR was used for limited low altitude propeller departures). DTW satellite arrivals that used to use the HADAR arrival fix will now use the new PICES arrival fix.

The PICES arrival fix is located approximately 71 miles northeast of Detroit in Ontario Canada, approximately 7 miles south of Petrolia, Ontario. The net effect of moving these satellite arrivals to PICES is to separate the DTW satellite traffic from the primary DTW jet traffic and simplify the operational complexity.

#### C.4.4.1.3 DTW MASE Airspace Alternative – CETUS (Southeast) Arrivals

Changes in the MASE Airspace Redesign Alternative from the No Action Airspace Alternative would be realized in that the GEMNI arrival fix replaces CETUS and the new arrival fix WEEDA is added further south and west of GEMNI in the MASE Airspace Redesign Alternative.

The CETUS fix is located over Lake Erie just south of North Bass Island, and between this island and Middle Bass Island. The new GEMNI arrival fix is located approximately 2 miles northeast of the CETUS fix. The new WEEDA fix is located approximately 15 miles west of GEMNI and approximately 8 miles north of Long Beach, OH and the southern Lake Erie shoreline.

The net effect of moving the existing CETUS arrivals to DTW to the GEMNI fix is to basically shift these existing flows slightly towards the northeast. This shift was primarily done to provide the necessary maneuvering airspace to establish the additional DTW arrival fix at WEEDA.

The new WEEDA arrival fix provides a much needed additional arrival route into the DTW terminal airspace. With this additional arrival route Cleveland will be able to deliver more aircraft to the Detroit TRACON (D21) and subsequently from the D21 to the DTW tower. This new arrival flow will arrive east of MFD from the south, and will be gradually arched towards the northwest to the WEEDA fix. From this point aircraft are either sent west northwest for sequencing to the northeast runways (04L/04R or 03L/03R) or vectored north for sequencing to the southwest runways (22R/22L or 21R/21L).

#### C.4.4.1.4 DTW MASE Airspace Alternative – MIZAR (Southwest) Arrivals

There are no major changes from the No Action Airspace Alternative to the MASE Airspace Redesign Alternative for DTW arrivals arriving over the southwest MIZAR aeronautical fix, located in north central Lenawee County, MI, approximately 1 mile north of Fairfield, MI, and approximately 45 miles southwest of DTW. Some former MIZAR traffic will be transitioned to WEEDA.

#### C.4.4.1.5 DTW MASE Airspace Alternative – POLAR (North) Arrivals

There are no changes from the No Action Airspace Alternative to the MASE Airspace Redesign Alternative for DTW arrivals arriving over the north POLAR arrival fix located in southeast Genesee County, MI, between 1 and 2 miles north of Fenton, MI, (adjacent to US-23), and approximately 47 miles north northwest of DTW.

### C.4.5 MASE Airspace Redesign Alternative - DTW Departures

Detroit (DTW) departures for the MASE Airspace Redesign Alternative represent a variety of modified procedures for exiting DTW and D21 airspace. Description of these departure procedures has been done primarily on an exception basis, describing mainly those aspects of the MASE design that have changed from the No Action Airspace Alternative. With this approach specific runway use descriptions, as was done for the No Action alternative have been abandoned and the descriptions focus on only the changes between the two alternatives. Note that references to standardized ATC traffic patterns (e.g., downwind, base and final legs) are explained in detail in **Appendix B**.

NAVAIDS and fixes comprising Detroit departures reflect the following high-level attributes when comparing the MASE Alternative Airspace Redesign and the No Action Airspace Alternative.

- The existing east gate WINGS departure fix would be replaced by the MAARS departure fix in the MASE Alternative Airspace Design.

- The existing east gate TYCOB departure fix would be replaced by the ERRTH departure fix in the MASE Alternative Airspace Design.

- The existing east gate limited HADAR low altitude departure fix usage would be discontinued (as well as existing higher volume HADAR arrival fix usage) and the fix replaced by the MOONN departure fix. The new MOONN departure fix would be used as a major new third east jet departure fix in the MASE Alternative Airspace Design. The HADAR fix would no longer be used.

- West gate Tower en route traffic (MSP, MKE, GRR and GRB) would be moved from the existing DUNKS departure fix to the EARVN departure fix, and HARWL would experience no change.

- South gate departure fixes, ANNTS, CAVVS would continue to be used as is done today, while SCORR would also be used for jet departures in the MASE.

- The existing north gate fixes of LAYNE and PISTN would experience no changes.

### C.4.5.1 Overview of MASE Airspace Alternative - DTW Departures

Aircraft from DTW depart to a number of nodal points surrounding DTW airspace. Departures towards the north through the north gate depart over the LAYNE aeronautical departure fix located in southwest Lapeer County, MI. Departures towards the north and northeast through the north gate from DTW also depart over the PISTN aeronautical departure fix located in southeast Lapeer County, MI.

Departures towards the east through the east gate depart over the ERRTH aeronautical departure fix located in Ontario, Canada between Lake St. Clair and Lake Erie, approximately 2 miles south of Tilbury, Ontario. Note that in the No Action Airspace Alternative this flow was over the TYCOB aeronautical departure fix located in Ontario, Canada between Lake St. Clair and Lake Erie, approximately 1 mile south of Tilbury, Ontario.

Departures to the east and southeast of the east gate also depart through the MAARS aeronautical departure fix located in Ontario, Canada adjacent to Lake Erie, approximately 5 miles northeast of Learnington, Ontario. Note that in the No Action Airspace Alternative this flow was over the WINGS aeronautical departure fix located in Ontario, Canada adjacent to Lake Erie, approximately 5 miles east of Learnington, Ontario.

Departures to the east and northeast of the east gate also depart through the MOONN aeronautical departure fix located in Ontario, Canada over Lake St. Clair, approximately 12 miles west of Chatham, Ontario. Note that in the No Action Airspace Alternative this flow was over the HADAR aeronautical departure fix located in Ontario, Canada over Lake St. Clair, approximately 13 miles west of Chatham, Ontario.

Departures towards the southeast, south and southwest depart through the south gate over the SCORR (used for both props and jets in the MASE alternative), CAVVS and ANNTS aeronautical departure fixes respectively. The SCORR aeronautical departure fix is located in eastern Lucas County, OH approximately 6-7 miles east of Toledo, OH and less than 2 miles from the Lake Erie shoreline. The CAVVS aeronautical departure fix is located in Toledo, OH (central Lucas County, OH) adjacent to I-75, less than 1 mile north of the interchange of I-75 and I-475. The ANNTS aeronautical departure fix is located in north western Lucas County, OH less than 5 miles west of the I-475 and US-23 interchange, and less than 3 miles south of the OH and MI border.

Departures towards the west, southwest and northwest depart through the west gate over the HARWL and DUNKS aeronautical departure fixes. The HARWL aeronautical departure fix is located in eastern Jackson County, MI, south of I-94 and less than 10 miles east of Jackson, MI. The DUNKS aeronautical departure fix is located in southeast Ingham County, MI and west of SR-52, adjacent to the Ingham County and Jackson County, MI border. An exception is that DTW west gate departures en route to Minneapolis (MSP), Milwaukee (MKE), Grand Rapids (GRR) and Green Bay (GRB) would depart via the EARVN departure fix located in southeast Ingham County, MI, adjacent to SR-52/SR-36, near White Oak, MI.

#### C.4.5.1.1 MASE Airspace Alternative – DTW West Gate Departures (HARWL, DUNKS and EARVN) from DTW

There is a change in the MASE Airspace Redesign Alternative with regard to DTW departures destined to MSP, MKE, GRR and GRB. Rather than being routed via the DUNKS fix, they would be routed via the EARVN fix. Departures from Runways 03L/03R would transition to EARVN near South Lyon, MI, while Runway 22L.22R departures would transition to EARVN near Ann Arbor, MI.

#### C.4.5.1.2 MASE Airspace Alternative – DTW East Gate Departures (HADAR, TYCOB and WINGS) from the DTW

Changes in the MASE Airspace Redesign Alternative from the No Action Airspace Alternative would be realized in that there is a change in the MASE Airspace Redesign Alternative, where ERRTH replaces TYCOB, MARRS replaces WINGS, and MOONN replaces HADAR (which is used in a limited manner for low altitude propeller departures today). Note that HADAR would not be used in the future.

The net effect of these fix changes is a one to two mile change in fix position relative to the existing fix positions.

#### C.4.5.1.3 No Action Airspace Alternative – DTW South Gate Departures (SCORR, CAVVS and ANNTS) from the DTW Southwest Runways (22L-22R and 21L-21R)

Changes in the MASE Airspace Redesign Alternative from the No Action Airspace Alternative would be realized in that for the MASE Airspace Redesign, the SCORR departures will be used for jet departures in the MASE. The turboprop departures will continue to use the SCORR departure fix for south gate departures.

#### C.4.5.1.4 No Action Airspace Alternative – DTW North Gate Departures (LAYNE and PISTN) from the DTW

There are no changes from the No Action Airspace Alternative to the MASE Airspace Redesign Alternative for DTW departures departing over either the LAYNE or PISTN departure fixes, located in southern Lapeer County, MI.

### C.4.6 CLE/DTW Satellite Airport Airspace Redesign – No Action and MASE Airspace Design Differences

A number of satellite airports were assessed when determining the airports that were to be considered in the MASE environmental analysis. An initial list of airports was developed that encompassed public use facilities within a 50 mile radius of each primary airport. From this list, and as enumerated in **Tables 1-1** and **1-2** in **Chapter 1**, a total of fifteen airports were included in the noise modeling for the airspace redesign. These fifteen airports have an average of 10 or more daily IFR operations and thus could have been affected by the proposed MASE airspace changes. Based on the satellite airport routing analysis and validation by CLE ATCT/TRACON and DTW ATCT and D21 TRACON personnel it was determined that 10 of these airports could

be affected by the proposed MASE changes. This means that some aspect of MASE would affect how aircraft are routed either towards or away from these airports when compared to a No Action scenario. These airports include:

**Cleveland Burke Lakefront Airport (BKL)**

**Cuyahoga County Airport (CGF)**

**Akron/Canton Regional Airport (CAK)**

**Windsor Airport, Ontario, Canada (CYQG)**

**Detroit City Airport (DET)**

**Bishop International Airport (FNT)**

**Oakland County International Airport (PTK)**

**Toledo Express Airport (TOL)**

**Willow Run Airport (YIP)**

**Ann Arbor Municipal Airport (ARB)**

These airports are summarized in the following paragraphs.

### Cleveland Burke Lakefront Airport (BKL)

Cleveland Burke Lakefront Airport (BKL) is located approximately 11 miles northeast of CLE, northeast of the Flats Entertainment District and north of the Warehouse District on Lake Erie. BKL airport serves general aviation users as an alternative to CLE while providing convenient access to downtown Cleveland.

### BKL Arrivals

BKL arrivals presently come from a number of directions using some of the same aeronautical fixes and NAVAIDS used for CLE arrivals.

- Northwest over GONNE (Changes to HIMEZ in the MASE Alternative)
- West over VWV-WAKEM (Changes to HIMEZ in the MASE Alternative)
- Southwest over ROD-WAKEM (Changes to ABERZ in the MASE Alternative)
- South over KEATN
- Southeast over ACO (only on low altitude traffic)

- Northeast over Lake Erie shoreline roughly approximating the US-20, SR-2 and I-90 corridor.

Arrivals into BKL essentially remain the same as the No Action alternative, with the exceptions of flights moving from GONNE to HIMEZ (northwest) and flights moving from ROD-WAKEM to ABERZ (southwest), and VWV-WAKEM flights moving to HIMEZ.

**BKL Departures**

BKL departures presently head in a number of directions using many of the same aeronautical fixes and NAVAIDS used for CLE departure routes.

- Northwest over KITTY and JUNKR. Propeller departures will change to LLEEO, Jet departures will change to AMRST. This applies to all CLE satellite traffic.
- West over SKY (Changes to ARMST in the MASE Alternative)
- Southwest over MFD NAVAID (Changes to OBRLN)
- Southeast over ACO
- East southeast over US-422 corridor (between CXR and ACO)
- Northeast roughly approximating the I-90 corridor (between FAILS and CXR)
- South over APE

Departures from BKL essentially remain the same as the No Action alternative, with the noted exceptions of the northwest and west departures flying to ARMST prior to transitioning to the northwest or west. The northwest departures head north northwest from ARMST to an area south southwest of DTW where they then transition to the northwest. The west departures head west northwest from ARMST and fly southwest of Toledo Express Airport where they then transition to the west.

**Cuyahoga County Airport (CGF)**

Cuyahoga County Airport (CGF) is located approximately 21 miles northeast of CLE, south of I-91 and west of I-271. CGF airport serves general aviation users as an alternative to CLE while providing convenient access to northeast Cleveland business areas and suburbs.

**CGF Arrivals**

CGF arrivals presently come from a number of directions using some of the same aeronautical fixes and NAVAIDS used for CLE arrival routes.

- Northwest over GONNE (Changes to HIMEZ in the MASE Alternative)
- From the West over VWV-WAKEM (Changes to HIMEZ in the MASE Alternative)

- Southwest over WAKEM (Changes to ABERZ in the MASE Alternative)
- South over KEATN
- East over CXR
- Northeast over Lake Erie shoreline roughly approximating the US-20, SR-2 and I-90 corridor.

Arrivals into CGF essentially remain the same as the No Action alternative, with the exceptions of flights moving from GONNE to HIMEZ (northwest) and flights moving from WAKEM to ABERZ (southwest), including the VWV-WAKEM transition flights to HIMEZ and the ROD-WAKEM flights to ABERZ.

**CGF Departures**

CGF departures presently head in a number of directions using many of the same aeronautical fixes and NAVAIDS used for CLE departure routes.

- Northwest over KITTY and JUNKR (Changes to LLEEO in the MASE Alternative). Propeller departures will change to LLEEO, Jet departures will change to AMRST. This applies to all CLE satellite traffic.
- West over SKY (Changes to ARMST in the MASE Alternative)
- Southwest over MFD Airport area and the HERAK departure fix changes to OBRLN
- Southeast over ACO
- Northeast over FAILS
- South over APE

Departures from CGF essentially remain the same as the No Action alternative, with the noted exceptions of the west departures flying to ARMST and then to WVW prior to transitioning to the west. The northwest departures transition slightly towards the northeast from the JUNKR departure fix to the LLEEO departure fix for propeller aircraft, while jets will go AMRST-CRL.

**Akron/Canton Regional Airport (CAK)**

Akron/Canton Regional Airport (CAK) is located approximately 40 miles southeast of CLE, west of I-77. CAK provides limited commercial service and general aviation user access in the Akron and Canton metropolitan areas.

**CAK Arrivals**

CAK arrivals presently come from a number of directions using some of the same aeronautical fixes and NAVAIDS used for CLE arrival routes.

- Northwest over GONNE (Minor changes to HIMEZ in the MASE Alternative)
- West arrivals are widely dispersed from a path north of MFD towards Wooster and Massillon, OH.
- South roughly approximating I-77 and South Southwest over APE
- Southeast over Jefferson County, OH
- East over Youngstown, OH

Arrivals into CAK essentially remain the same as the No Action alternative, with the exceptions of flights moving from GONNE to HIMEZ (northwest) where tracks are shifted slightly southwest.

**CAK Departures**

CAK departures presently head in a number of directions using many of the same aeronautical fixes and NAVAIDS used for CLE departure routes.

- Northwest over KITTY and JUNKR (Changes to LLEEO in the MASE Alternative only for Detroit area satellites).
- Northwest over CETUS (Changes to GEMNI in the MASE Alternative only for DTW arrivals)
- West over MFD
- Southwest between Wooster and Massillon, OH towards APE.
- South Southwest between APE and I-77.
- South roughly approximating I-77
- East ranging from Alliance to Youngstown, OH
- Northeast towards CXR, ACO and Warren, OH

Departures from CAK essentially remain the same as the No Action alternative, with the noted exceptions of the northwest departures transitioning slightly towards the northeast from the JUNKR departure fix to the LLEEO departure fix, and the other northwest departures transitioning slightly towards the northeast from the CETUS fix to the GEMNI fix.

**Windsor Ontario Airport, Canada (CYQG)**

Windsor Ontario Airport, Canada (YQG) is located approximately 18 miles east northeast of DTW, in Windsor Ontario, Canada, south of Highway 2, north of Highway 401 and east of

Highway 3B. YQG provides commercial service and general aviation user access to the Windsor, Ontario metropolitan area.

### YQG Arrivals

YQG arrivals presently come from a number of directions using their own specific satellite arrival fixes.

- Southwest over VWV
- Northeast over HADAR which is changing to the PICES STAR.

Arrivals into YQG essentially remain the same as the No Action alternative, with the exception of flights moving from HADAR to PICES (northeast).

### YQG Departures

YQG departures presently head in a number of directions using some of the same aeronautical fixes and NAVAIDS used for DTW departure routes.

- East departures use the TYCOB fix
- Northeast departures use the VERNR to PICES fix transition
- North and Northwest departures use the PISTN and LAYNE fixes
- West departures initially head northwest towards PISTN then turn west towards DUNKS when north of Detroit City Airport. Note that another westerly flow first heads southwest from YQG towards Grosse Ile then turns Northwest towards DUNKS (passing southwest of DTW)

Departures from YQG essentially remain the same as the No Action alternative, with the noted exceptions of the southwest jet departures which would use SCORR in addition to AANTS and CAAVS.

### Detroit City Airport (DET)

Detroit City Airport (DET) is located approximately 22 miles northeast of DTW, east of I-75, north and west of I-94. DET serves general aviation users in the eastern Detroit metropolitan area.

### DET Arrivals

DET arrivals presently come from a number of directions having their own specific satellite arrival fixes.

- South dispersed over a wide swath of airspace between CAK and MFD (MASE reroute over LLEEO)

- Southwest over VWV

- Northwest roughly paralleling I-96 to the north. Arrivals from the northwest arrive over SPRTN this will be unchanged in the MASE arrivals from the northeast arrive over HADAR, which will change to the PICES in MASE.

- East over HEGEL and HADAR (MASE reroute is now over PICES)

Arrivals into DET remain somewhat the same as the No Action alternative, with the exception of flights moving from HEGEL-HADAR to PICES as well as the change of moving JUNKR to LLEEO

**DET Departures**

DET departures presently head in a number of directions using some of the same aeronautical fixes and NAVAIDS used for DTW departure routes.

- East departures use the TYCOB fix (MASE reroute over ERRTH, MOONN or MARRS)

- Southwest departures over ANNTS, CAVVS and SCORR (with some west transitions to DUNKS)

- West departures over HARWL and DUNKS (with some southwest transitions to ANNTS and CAVVS)

- Northwest departures to LAYNE

Departures from DET essentially remain the same as the No Action alternative, with the noted exceptions of the east departures flying to ERRTH, MOONN or MARRS

**Bishop International Airport (FNT)**

Bishop International Airport (FNT) is located approximately 55 miles north northwest of DTW, and southwest of the confluence of I-75 and I-69. FNT provides commercial service and general aviation user access to the Flint metropolitan area.

**FNT Arrivals**

FNT arrivals presently come from a number of directions using some of the same aeronautical fixes and NAVAIDS used for DTW arrival routes.

- South arrivals are dispersed over a wide swath of airspace between CAK and MFD. These flights are vectored north towards the I-69 corridor, then west towards the airport.

- Southeast FNT arrivals arrive over a wide swath of airspace between CAK and Warren, OH. These flights are then vectored in a more constricted funnel towards FNT (between Oakland Troy Airport and Selfridge ANG base)

- South arrivals to FNT are widely dispersed over Toledo Express Airport (west of Willow Run Airport, YIP)

- Another south flow is widely dispersed west of the previous flow, where upon reaching the HARWL fix they are vectored to the northeast towards FNT.

- Southwest, west and northwest of FNT from the general direction of Chicago, Milwaukee and Green Bay.

Arrivals into FNT remain the same as the No Action alternative.

**FNT Departures**

FNT departures presently head in a number of directions using some of the same aeronautical fixes and NAVAIDS used for DTW departure routes.

- East departures that are dispersed towards the south over DTW (these flights are shifted towards the west over YIP in the MASE routing). The east departures are also vectored south southeast over a wide swath of airspace towards MFD.

- Southeast departures are dispersed just east of Windsor, Ontario Airport over a swath of airspace between CLE and BKL

- Southwest, west and northwest departures from FNT depart in the general directions of Chicago, Milwaukee and Green Bay. Note that there is south southwest transitional flow from the southwest flow dispersed towards the Ohio and Indiana state lines.

Departures from FNT essentially remain the same as the No Action alternative, with the noted exception of the south departures that shifted from over DTW and towards the west over YIP in the MASE routing.

**Oakland County International Airport (PTK)**

Oakland County International Airport (PTK) is located approximately 31 miles north of DTW, north of SR-59 and west of US-24. PTK serves general aviation users in the greater northwestern Detroit metropolitan area.

**PTK Arrivals**

PTK arrivals presently arrive by way of their own specific satellite arrival fixes.

Southeast arrivals are dispersed over a wide swath of airspace between from west of MFD to north of CGF. These flights are vectored from northerly, northwesterly to almost westerly to JUNKR then either directly north northwest towards PTK or north and then northwest towards the airport. These flights are shifted northeast towards LLEEO in the MASE routing

- Two distinct eastern flows converge on PTK, one north of the Selfridge ANG base (MTC) and the other south. The south flow comes over HADAR, and will be shifted to

PICES towards the north in the MASE alternative. The east flow to the north of MTC comes directly from the east passing over the northern portions of Lake St. Clair and into PTK.

- Northwest PTK arrivals come in over the SPRTN fix
- Western PTK arrivals come in over SPRTN or CRUXX fixes
- Southwest arrivals to PTK will arrive over CRUXX

Arrivals into PTK essentially remain the same as the No Action alternative, with the exception of flights moving from HADAR to PICES (east), and the JUNKR to LLEEO shift for flights from the southeast.

**PTK Departures**

PTK departures presently head in a number of directions using some of the same aeronautical fixes and NAVAIDS used for DTW departure routes.

- East departures are initially sent southeast towards TYCOB (where these flights will be shifted towards the north over either ERRTH, MOONN or MARRS) in the MASE routing)
- Southeast departures are sent towards WINGS and then dispersed over a swath of airspace between CLE and CGF. MASE rerouting will shift these flights north and east into two distinct flows, ERRTH and MAARS one of which passes northeast of CGF while the other passes over Ashtabula, OH.
- South departures from PTK depart towards SCORR, CAVVS and ANNTS
- Southwest and west departures from PTK head towards EARVN, HARWL and DUNKS and are then dispersed towards their destinations.
- North departures from PTK depart over LAYNE
- Northeast departures from PTK depart over PISTN, as well as over a dispersed flow south and east of PISTN.

Departures from PTK essentially remain the same as the No Action alternative, with the noted exception of the east and southeast departures that are shifted in the MASE rerouting.

**Toledo Express Airport (TOL)**

Toledo Express Airport (TOL) is located approximately 50 miles south southwest of DTW, south of I-80 and west of I-475. TOL provides commercial service and general aviation user access to the Toledo metropolitan area.

### TOL Arrivals

TOL arrivals presently have their own arrival routings paths.

- Northeast arrivals approach TOL over Lake Erie, arriving over the HARBS fix.
- Southeast TOL arrivals arrive over a wide swath of airspace over and towards the northeast of MFD airport. These flights are then vectored northwest towards TOL.
- South arrivals approach TOL from a widely dispersed flow over Wyandot County, OH. Another widely dispersed south flow comes in over Henry County, OH.
- West arrivals approach TOL from a widely dispersed flow over Williams and Fulton counties, OH.
- Northwest arrivals approach TOL from a widely dispersed flow over Hillsdale County, MI.

Arrivals into TOL essentially remain the same as the No Action alternative.

### TOL Departures

TOL departures presently head in a number of directions using a few of the same aeronautical fixes and NAVAIDS used for DTW departure routes.

- Northeast departures from TOL are dispersed EAST then over Lake Erie towards HIMEZ
- East departures from TOL are dispersed over VARYS continuing over Lake Erie and passing north of BKL over Ashtabula County, OH.
- Southeast departures from TOL depart towards ACO
- South departures from TOL parallel the I-75 corridor and are subject to some minor changes for close in routing based on MASE reroutes.
- Southwest, west and northwest departures from TOL are dispersed in wide swaths in the directions of Ft. Wayne, Chicago and Kalamazoo respectively before exiting the noise analysis study area.
- North departures from TOL are sent to MIZAR

Departures from TOL essentially remain the same as the No Action alternative, with the noted exception of the south departures that are shifted slightly due to the MASE rerouting.

## Willow Run Airport (YIP)

Willow Run Airport (YIP) is located approximately 10 miles west northwest of DTW, north of I-94 and south of US-12. YIP serves general aviation users in the Ypsilante and southwestern Detroit metropolitan areas.

### YIP Arrivals

YIP arrivals presently come from a number of directions and have their own specific satellite arrival fixes

- Southeast dispersed over a wide swath of airspace between MFD and CGF (MASE reroute is over LLEEO)
- South over VWV
- Southwest over CRUXX
- Northwest or west over SPRTN
- North over POLAR, SPRTN
- Northeast over HEGEL and HADAR (MASE reroute is over PICES)

Arrivals into YIP remain somewhat the same as the No Action alternative, with the exception of flights moving from HEGEL-HADAR to PICES, as well as the southeast arrivals dispersed over a wide swath of airspace between MFD and CGF that would be rerouted from JUNKR to LLEEO.

### YIP Departures

YIP departures presently head in a number of directions using some of the same aeronautical fixes and NAVAIDS used for DTW departure routes.

- East departures use the TYCOB fix (MASE reroute over either ERRTH, MOONN or MARRS)
- Southeast departures are dispersed over a swath of airspace between CLE and CGF (moved further northeast of CGF and more tightly funneled in the MASE rerouting using ERRTH and MAARS
- South to southwest departures over ANNTS and CAVVS (with these flights transitioned east to SCORR)
- West departures over HARWL, EARVN and DUNKS
- Northwest departures to EARVN or LAYNE

- Northeast departures to PISTN

Departures from YIP remain somewhat the same as the No Action alternative, with the noted exceptions being to the east departures flying to MOONN, the southeast departures being more concentrated and moved towards the northeast (ERRTH and MAARS), and the options for shifting between ANNTS and CAVVS and SCORR as alternative routing options.

### Ann Arbor Municipal Airport (ARB)

Ann Arbor Municipal Airport (ARB) is located approximately 20 miles west of DTW, south of I-94 and west of US-23. ARB serves general aviation users in the Ann Arbor metropolitan area.

### ARB Arrivals

ARB arrivals presently come from two primary directions.

- Easterly ARB arrivals are dispersed in two flows (north and south) of DTW for northeast and southwest approaches to ARB.

- Westerly ARB arrivals are dispersed in two flows (north and south) of DTW for northeast and southwest approaches to ARB.

Arrivals into ARB do not effectively change in the MASE alternative.

### ARB Departures

ARB departures presently depart in two primary directions.

- Northeast until being sequenced in the D21 flow for vectoring to intended destination using D21 departure fixes

- Southwest until being sequenced in the D21 flow for vectoring to intended destination using d21 departure fixes

Departures from ARB do not effectively change in the MASE alternative.

## C.5 MASE HIGH ALTITUDE AIRSPACE ROUTE CHANGES

The following tables and graphics depict the high altitude MASE redesign routing that is being analyzed in this EA with the potential environmental impacts of terminal area changes identified in the MASE Airspace Redesign Environmental Study Area. These high altitude airspace design changes are part of the MASE High-Altitude Airspace Redesign Study Area. The overall MASE High-Altitude Airspace Redesign Study Area encompasses the high-altitude center reroute procedures and covers a large portion of airspace from the upper Midwest to Boston and south to Miami, thus covering a large swath of airspace that is east of the Mississippi River as shown in **Figure 1-1** of Chapter One. The MASE High-Altitude Airspace Redesign Study Area is used to describe and disclose the high-altitude airspace changes that were not evaluated for changes in noise exposure per the requirements of FAA Order 1050.1E "Environmental Impacts: Policies and Procedures." This Order stipulates that no noise analysis is required for airspace changes at or above 10,000 feet above ground level (AGL).[1] Note that some of the routes do not change from the No Action to the Proposed Action. This is due to route changes that were initially identified for consideration but subsequently not changed in the MASE project.

[1] FAA Order 1050.1E, "Environmental Impacts: Policies and Procedures;" Effective Date June 8, 2004; Appendix A, pp. A-64, Paragraph 14.5e.

**Table C-2: Example MASE Airspace Route Changes**

| Reroute Number | Departure Airports | Arrival Airports | Altitude Restrictions | Example Departure Airport | Example Arrival Airport | Alternative | Example Route |
|---|---|---|---|---|---|---|---|
| 1 | DTW, DET, PTK | ATL | | DTW | ATL | No Action | CAVVS-VWV-ROD-J43-VXV-MACEY2 |
| | | | | | | Proposed Action | CAVVS1-RID-IIU-BWG-RMG2 |
| 2 | TOL, FNT, LAN | ATL | | FNT | ATL | No Action | CRL-J43-VXV-MACEY2 |
| | | | | | | Proposed Action | VWV-RID-IIU-BWG-RMG2 |
| 3 | MSP | ATL | | MSP | ATL | No Action | ODI-J30-BRIBE-BDF-ENL-ENL162-PLESS-J45-BNA-RMG2 |
| | | | | | | Proposed Action | ODI-J30-BRIBE-BDF-ENL-ENL162-PLESS-J45-TINGS-SALMS-RMG2 |
| 4 | DAY, GRR, SBN, CVG | ATL | | CVG | ATL | No Action | BLGRS5-BWG-RMG2 |
| | | | | | | Proposed Action | BLGRS5-IIU-BWG-RMG2 |
| 5 | MCO | MSP | | MCO | MSP | No Action | CAMAN-CTY-J151-WYATT-J73-PXV-CAP-IOW-ALO-KASPR2 |
| | | | | | | Proposed Action | CTY-VUZ-ALO-KASPR2 |
| 6 | MCO, MIA, FLL, PBI | STL | | FLL | STL | No Action | THNDR-LAL-J73-SZW-VUZ-J151-VISQA-QBALL6 |
| | | | | | | Proposed Action | THNDR-CTY-J151-VISQA-QBALL6 |
| 7 | MSP | MIA | | MSP | MIA | No Action | ODI-J30-JOT-TTH-IIU-J99-IRQ-J53-CRG-OMN-J79-VRB-HEATT6 |
| | | | | | | Proposed Action | ALO-J233-J45-STL-J45-BNA-J73-SZW-J43-PIE-CYY3 |
| 8 | STL | MIA | | STL | MIA | No Action | PLESS1-BNA-J45-OMN-J79-VRB-HEATT6 |
| | | | | | | Proposed Action | PLESS1-BNA-J73-SZW-J43-PIE-CYY3 |
| 9 | MSP | FLL | | MSP | FLL | No Action | ODI-J30-BRIBE-ENL-ENL162-PLESS-J45-BNA-J73-SZW-J41-PIE-FORTL |
| | | | | | | Proposed Action | ALO-J233-J45-STL-J45-BNA-J73-SZW-J43-PIE-FORTL4 |
| 10 | STL | FLL | | STL | FLL | No Action | LINDBERGH-DP-MAW-VUZ-J39-MGM-SZW-J43-PIE-FORTL-STAR |
| | | | | | | Proposed Action | PLESS1-BNA-J73-SZW-J43-PIE-FORTL4 |
| 11 | MSP | PBI | | MSP | PBI | No Action | ODI-J30-BRIBE-BDF-ENL-ENL162-PLESS-J45-BNA-J73-SZW-CTY-J91-J85-LLAKE3 |
| | | | | | | Proposed Action | ALO-J233-J45-STL-J45-BNA-J73-SZW-CTY-LLAKE3 |
| 12 | STL | PBI | | STL | PBI | No Action | PLESS1-BNA-J45-OMN-J79-VRB |
| | | | | | | Proposed Action | PLESS1-BNA-J73-SZW-CTY-LLAKE3 |
| 13 | JAX | DTW | All at or below FL300 at ZID/ZOB boundary | JAX | DTW | No Action | SSIW-SAV-SPA-J85-DJB-CETUS-CETUS2 |
| | | | | | | Proposed Action | NOWAY-J53-SPA-HNN-WEEDA1 |
| 14 | FLL, PBI, MIA | DTW | All at or below FL300 at ZID/ZOB boundary | FLL | DTW | No Action | ARKES-J20-ORL-J81-IRQ-J85-DJB-CETUS-CETUS2 |
| | | | | | | Proposed Action | ORL-J53-SPA-HNN-WEEDA1 |
| 15 | MCO | DTW | All at or below FL300 at ZID/ZOB boundary | MCO | DTW | No Action | JAG3-IRQ-J85-DJB-CETUS-CETUS2 |
| | | | | | | Proposed Action | JAG3-IRQ-J53-SPA-HNN-WEEDA1 |
| 16 | TPA, SRQ, PIE | DTW | All at or below FL300 at ZID/ZOB boundary | PIE | DTW | No Action | SPNGE-CTY-J91-VXV-J43-FLM-DQN-MIZAR3 |
| | | | | | | Proposed Action | TAY-J85-SPA-HNN-WEEDA1 |
| 17 | RSW | DTW | All at or below FL300 at ZID/ZOB boundary | RSW | DTW | No Action | JOCK-LAL-CTY-J91-VXV-J43-FLM-DQN-MIZAR3 |
| | | | | | | Proposed Action | JOCKS-ORL-J53-SPA-HNN-WEEDA1 |
| 18 | ATL, TYS | DTW | All at or below FL300 at ZID/ZOB boundary | ATL | DTW | No Action | NOTWO-FLM-DQN-MIZAR3 |
| | | | | | | Proposed Action | NOTWO-VXV-J91-HNN-4054/8222-4118/8235-WEEDA1 |
| 19 | BNA, BHM | DTW | | BHM | DTW | No Action | J39-IIU-DQN-MIZAR3 |
| | | | | | | Proposed Action | BNA-IMPEL-VHP-FWA-MIZAR3 |
| 20 | BNA, BHM | DTW | | BHM | DTW | No Action | J39-HICKI-DQN-MIZAR3 |
| | | | | | | Proposed Action | BNA-CCT-VHP-FWA-MIZAR3 |
| 21 | MSY | DTW | | MSY | DTW | No Action | MEI-BNA-J39-IIU-DQN-MIZAR3 |
| | | | | | | Proposed Action | MEM-J29-IMPEL-VHP-FWA-MIZAR3 |
| 22 | GSP | DTW | At or below FL300 at ZID/ZOB boundary | GSP | DTW | No Action | SPA-J85-HVQ-J85-DJB-CETUS-CETUS2 |
| | | | | | | Proposed Action | SPA-HMV-HNN-WEEDA1 |

**Table C-2: Example MASE Airspace Route Changes**

| Reroute Number | Departure Airports | Arrival Airports | Altitude Restrictions | Example Departure Airport | Example Arrival Airport | Alternative | Example Route |
|---|---|---|---|---|---|---|---|
| 23 | MDW | DTW | | MDW | DTW | No Action | GIJ-LFD-MIZAR3 |
| | | | | | | | GIJ-V6-V98-MIZAR |
| | | | | | | Proposed Action | GIJ-LFD-MIZAR3 |
| 24 | DCA, IAD, BWI | DTW | At or below FL260 at ZDC/ZOB boundary | BWI | DTW | No Action | JERES-J211-JST-J211-HAGUD-DJB-CETUS-CETUS2 |
| | | | | | | Proposed Action | MCRAY-J518-DJB-GEMNI1 |
| 25 | DCA, IAD, BWI | DTW | At or below FL300 at ZID/ZOB boundary | BWI | DTW | No Action | JERES-J211-JST-J211-HAGUD-DJB-CETUS-CETUS2 |
| | | | | | | Proposed Action | AML-AML281-SINDE-GEMNI1 |
| 26 | RIC, ORF | DTW | At or below FL300 at ZID/ZOB boundary | ORF | DTW | No Action | WAIKS-ORF290-ORF290079-FAK-J109-LEONI-J211-HAGUD-DJB-CETUS-CETUS2 |
| | | | | | | Proposed Action | MOL-GEMNI1 |
| 27 | RDU | DTW | At or below FL300 at ZID/ZOB boundary | RDU | DTW | No Action | PACK5-AZELL-PSK-HVQ-J85-DJB-CETUS-CETUS2 |
| | | | | | | Proposed Action | AZELL-PSK-BKW-GEMNI1 |
| 28 | GSO | DTW | At or below FL300 at ZID/ZOB boundary | GSO | DTW | No Action | BOTTM-HVQ-J85-DJB-CETUS-CETUS2 |
| | | | | | | Proposed Action | BOTTM-BKW-GEMNI1 |
| 29 | ROA, MYR | DTW | At or below FL300 at ZID/ZOB boundary | MYR | DTW | No Action | SDZ-GSO-HVQ-DJB-CETUS-CETUS2 |
| | | | | | | Proposed Action | BKW-GEMNI1 |
| 30 | CLT | DTW | At or below FL300 at ZID/ZOB boundary | CLT | DTW | No Action | HOR1-NALEY-HVQ-J85-DJB-CETUS-CETUS2 |
| | | | | | | Proposed Action | HUG5-ROBAY-BKW-GEMNI1 |
| 31 | CHS | DTW | At or below FL300 at ZID/ZOB boundary | CHS | DTW | No Action | CAE-SPA-J85-DJB-CETUS-CETUS2 |
| | | | | | | Proposed Action | BKW-GEMNI1 |
| 32 | RDG, ABE | DTW | | ABE | DTW | No Action | ETX-V30-PSB-J60-DJB-CETUS-CETUS2 |
| | | | | | | Proposed Action | SFK-YQO-YQO269-SPICA-SPICA2 |
| 33 | MDT, PHL, ACY | DTW | | PHL | DTW | No Action | PTW-PTW320-J64-RAV-PSB-J60-DJB-CETUS-CETUS2 |
| | | | | | | Proposed Action | PENSY-J110-J518-DJB-GEMNI1 |
| 34 | PIT, CLE, CAK | DTW | | CAK | DTW | No Action | KEATN-V40-DJB-DJB310-CETUS-CETUS2 |
| | | | | | | Proposed Action | DJB-GEMNI1 |
| 35 | UNV | DTW | | UNV | DTW | No Action | PSB-V6-DJB-CETUS-CETUS2 |
| | | | | | | Proposed Action | PSB-ERI-SPICA2 |
| 36 | LAS, LAX, PHX, SAN, SFO | DTW | At or below FL230 at ZAU/ZOB boundary | PHX | DTW | No Action | SJN3-SJN-J18-GCK-J18-SLN-J24-MCI-J80-VHP-FWA-MIZAR3 |
| | | | | | | | SILOW1-RSK-ALS-PUB-GLD-J197-OBH-J128-DBQ-BAE-MKG-POLAR1 |
| | | | | | | Proposed Action | SILOW1-RSK-ALS-PUB-GLD-J197-OBH-J128-DBQ-BAE-MKG-POLAR1 |
| 37 | MCI, MLI, PIA | DTW | At or below FL230 at ZAU/ZOB boundary | MCI | DTW | No Action | ROYAL3-JTHRO-IRK-BDF-J26-JOT-J146-GIJ-LFD-MIZAR3 |
| | | | | | | Proposed Action | ROYAL3-JTHRO-MKG-POLAR1 |
| 38 | CYYZ, YFK, YOW, YTZ, YUL, YXU, YQS, ROC, ITH, BUF, LGA, MHT, YHM, YOO, SYR, UCA, BDL | YIP, PTK, DET, YQG | | BDL | DET | No Action | CTR-CAM-J547-BUF-YQO-HADAR |
| | | | | | | Proposed Action | CTR-CAM-J547-BUF-YXU-PICES1 |
| 39 | TEB | YIP, PTK, DET, YQG | | TEB | DET | No Action | GAYEL-CFB-KOOPR-YQO-HADAR |
| | | | | | | Proposed Action | GAYEL-BUF-YXU-PICES1 |
| | | | | | | | PSB-LLEEO1 |
| 40 | ZID, ZTL, ZJX | YIP, PTK, DET, YQG | | CMH | DET | No Action | APE-DJB-JUNKR |
| | | | | | | Proposed Action | APE-DJB-LLEEO |

**Table C-2: Example MASE Airspace Route Changes**

| Reroute Number | Departure Airports | Arrival Airports | Altitude Restrictions | Example Departure Airport | Example Arrival Airport | Alternative | Example Route |
|---|---|---|---|---|---|---|---|
| 41 | DTW | TPA | | DTW | TPA | No Action | CAVVS-VWV-APE-J83-SPA-J85-TAY-LZARD3 |
| | | | | | | Proposed Action | SCORR1-ROD-FLM-VXV-AMG-TAY-LZARD3 |
| 42 | DTW | SRQ | | DTW | SRQ | No Action | CAVVS-VWV-APE-J83-SPA-J85-TAY-J119-PIE |
| | | | | | | Proposed Action | SCORR1-ROD-FLM-VXV-AMG-TAY-LAL |
| 43 | DTW | RSW | | DTW | RSW | No Action | CAVVS-VWV-APE-J83-SPA-J85-TAY-J75-HITTR-PIE-SRQ5 |
| | | | | | | Proposed Action | SCORR1-ROD-FLM-VXV-AMG-TAY-J75-KRNEL-PIE-SRQ5 |
| 44 | DTW | MIA | | DTW | MIA | No Action | CAVVS-VWV-APE-J83-SPA-SAV-J103-MILIE-J79-VRB-HEATT6 |
| | | | | | | Proposed Action | SCORR1-ROD-FLM-VXV-CRG-OMN-VRB-HEATT6 |
| 45 | DTW | FLL | | DTW | FLL | No Action | CAVVS-VWV-APE-J83-SPA-SAV-J103-MILIE-J79-OMN-MRLIN4 |
| | | | | | | Proposed Action | SCORR1-ROD-FLM-VXV-CRG-OMN-MRLIN4 |
| 46 | DTW | PBI | | DTW | PBI | No Action | CAVVS-VWV-APE-J83-SPA-SAV-J103-MILIE-J79-OMN-SURFN7 |
| | | | | | | Proposed Action | SCORR1-ROD-FLM-VXV-CRG-OMN-SURFN7 |
| 47 | DTW | JAX | | DTW | JAX | No Action | CAVVS-VWV-APE-J83-SPA-SAV-SSI3 |
| | | | | | | Proposed Action | SCORR1-ROD-FLM-VXV-AMG-AMG2 |
| 48 | DTW, YIP, PTK, DET, YQG | HOU, SHV | | DTW | SHV | No Action | CAVVS-VWV-ROD-J29-PXV-J131-LIT |
| | | | | | | Proposed Action | CAVVS-VWV-RID-PXV-J131-LIT |
| 49 | DTW, YIP, PTK, DET, YQG | IAH | | DTW | IAH | No Action | CAVVS-VWV-ROD-J29-PXV-J131-LIT-J180-SWB-DAS6 |
| | | | | | | Proposed Action | CAVVS1-RID-PXV-LIT-J180-SWB-DAS6 |
| 50 | DTW, YIP, PTK, DET, YQG | MEM | | DTW | MEM | No Action | CAVVS-VWV-ROD-J29-PXV-WLDER4 |
| | | | | | | Proposed Action | CAVVS1-RID-PXV-WLDER4 |
| 51 | DTW, YIP, PTK, DET, YQG | BHM, MMUN, MMIO | | CYQG | BHM | No Action | CAVVS-VWV-FDY-ROD-CVG-IIU-EWO-BWG-BNA-DCU-VUZ-BHM |
| | | | | | | Proposed Action | CAVVS-VWV-RID-IIU-EWO-BWG-BNA-DCU-VUZ-BHM |
| 52 | DTW, YIP, PTK, DET, YQG | BNA | | DTW | BNA | No Action | CAVVS-VWV-ROD-J39-IIU-GUITR3 |
| | | | | | | Proposed Action | CAVVS-VWV-RID-IIU-GUITR3 |
| 53 | DTW, YIP, PTK, DET, YQG | MSY | | DTW | MSY | No Action | CAVVS-VWV-ROD-J39-BNA-MEI-RYTHM3 |
| | | | | | | Proposed Action | CAVVS-VWV-RID-IIU-J39-BNA-MEI-RYTHM3 |
| 54 | DTW, YIP, PTK, DET, YQG | SDF | | DTW | SDF | No Action | CAVVS-VWV-ROD-PONIE3 |
| | | | | | | Proposed Action | SCORR-CHOOT-ROD-CVG-PONIE3 |
| 55 | DTW, YIP, PTK, DET, YQG | LEX | | DTW | LEX | No Action | CAVVS-VWV-ROD-CVG |
| | | | | | | Proposed Action | SCORR-CHOOT-ROD-CVG |
| 56 | DTW, YIP, PTK, DET, YQG | MCO | | DTW | MCO | No Action | CAVVS-VWV-ROD-J43-VXV-ODF-AMG-LEESE1 |
| | | | | | | Proposed Action | SCORR-CHOOT-ROD-FLM-VXV-AMG-LEESE1 |
| 57 | DTW, YIP, PTK, DET, YQG | DFW | | DTW | DFW | No Action | ANNTS1-FWA-RBS-STL-RZC-FSM-BYP5, |
| | | | | | | | CAVVS-VWV-ROD-J29-PXV-J131-LIT-BYP5 |
| | | | | | | Proposed Action | ANNTS1-FWA-RBS-STL-RZC-FSM-BYP5 |
| 58 | DTW, YIP, PTK, DET, YQG | SAT | | DTW | SAT | No Action | CAVVS-VWV-ROD-J29-PXV-J131-TXK-FZT-TNV-IDU-MARCS7 |
| | | | | | | Proposed Action | ANNTS1-FWA-RBS-STL-RZC-MLC-ACT-MARCS7 |
| 59 | DTW, YIP, PTK, DET, YQG | RIC, ORF | | DTW | ORF | No Action | WINGS-V103-ACO-AIR-AIR160-J24-MOL-TERKS2 |
| | | | | | | Proposed Action | MAARS1-ACO-AIR-MOL-FAK-TERKS2 |
| 60 | DTW, YIP, PTK, DET, YQG | RDU | | DTW | RDU | No Action | CAVVS-VWV-APE-HVQ-BKW-ROA-SBV4 |
| | | | | | | Proposed Action | MAARS1-ACO-AIR-EKN-ROA-SBV4 |
| 61 | DTW, YIP, PTK, DET, YQG | ROA | | DTW | ROA | No Action | CAVVS-VWV-APE-HVQ-BKW |
| | | | | | | Proposed Action | MAARS1-ACO-AIR-EKN |

**Table C-2: Example MASE Airspace Route Changes**

| Reroute Number | Departure Airports | Arrival Airports | Altitude Restrictions | Example Departure Airport | Example Arrival Airport | Alternative | Example Route |
|---|---|---|---|---|---|---|---|
| 62 | DTW, YIP, PTK, DET, YQG | ROA | At or below FL230 | DTW | ROA | No Action | SCORR-DXO184-FDY031-V493-APE-V45-HVQ-V258 |
| | | | | | | Proposed Action | SCORR1-CHOOT-APE-V45-HVQ-V258 |
| 63 | DTW, YIP, PTK, DET, YQG | GSP | | DTW | GSP | No Action | CAVVS-VWV-APE-HMV-SUG-V185-UNMAN |
| | | | | | | Proposed Action | SCORR1-ROD-FLM-SOT-V185-UNMAN |
| 64 | DTW, YIP, PTK, DET, YQG | CHS | | DTW | CHS | No Action | CAVVS-VWV-APE-HNN-HVQ-BKW-PSK |
| | | | | | | Proposed Action | SCORR1-ROD-FLM-HMV |
| 65 | DTW, YIP, PTK, DET, YQG | MYR | | DTW | MYR | No Action | CAVVS-VWV-APE-HVQ-BKW-PSK-CTF-FLO |
| | | | | | | Proposed Action | MAARS1-ACO-AIR-EKN-RDU |
| 66 | DTW, YIP, PTK, DET, YQG | GSO, INT | | DTW | GSO | No Action | CAVVS-VWV-APE-HVQ-GZG-BROOK2 |
| | | | | | | Proposed Action | MAARS1-ACO-AIR-EKN-ROA-HENBY |
| 67 | DTW, YIP, PTK, DET, YQG | CLT | | DTW | CLT | No Action | CAVVS-VWV-APE-HVQ-SHINE5 |
| | | | | | | Proposed Action | SCORR1-ROD-FLM-HMV-SHINE5 |
| 68 | DTW, YIP, PTK, DET, YQG | CRW | At or below FL200 at ZOB/ZID boundary | DTW | CRW | No Action | SCORR-DXO184-FDY031-V493-APE-HVQ |
| | | | | | | Proposed Action | MAARS1-ACO-AIR-HVQ |
| 69 | DTW, YIP, PTK, DET, YQG | CRW | At or below FL210 | DTW | CRW | No Action | SCORR-CHOOT-FDY-APE-HVQ |
| | | | | | | Proposed Action | SCORR1-CHOOT-APE-HVQ |
| 70 | DTW, YIP, PTK, DET, YQG | BGM, TEB, HPN, ALB, SYR, ELM, JFK, OWD, FOK, AVP, BDL, PVD | | DTW | ALB | No Action | TYCOB-YQG098-SURLY-J554-JHW-J82 |
| | | | | | | Proposed Action | MOONN1-BROKK-JHW-J82 |
| 71 | DTW, YIP, PTK, DET, YQG | BUF, ROC, IAG | | DTW | BUF | No Action | TYCOB-YQG098-DOLFN-DKK269-DKK |
| | | | | | | Proposed Action | MOONN1-BROKK-DKK |
| 72 | DTW, YIP, PTK, DET, YQG | LGA, RDG, ABE | | DTW | LGA | No Action | WINGS-V103-CAMRE-CXR-J146-ETG-MIP3 |
| | | | | | | Proposed Action | ERRTH-OCTAS-CXR-ETG-MIP3 |
| 73 | DTW, YIP, PTK, DET, YQG | EWR | | DTW | EWR | No Action | WINGS-V103-J584-SLT-FQM-FQM1 |
| | | | | | | Proposed Action | ERRTH-TRACE-DORET-SLT-FQM |
| 74 | DTW, YIP, PTK, DET, YQG | PHL, TTN, ILG, PNE, PTW | | DTW | PHL | No Action | WINGS-V103-ACO-ACO145-J518-J152-JST-BUNTS1 |
| | | | | | | Proposed Action | ERRTH-OCTAS-CXR-EWC-JST-BUNTS1 |
| 75 | ORD, MDW | PHL, TTN, ILG, PNE, PTW | | ORD | PHL | No Action | GIJ-J146-WOOST-J34-DJB-J518-AVERE-J152-JST-BUNTS1 |
| | | | | | | Proposed Action | GIJ-J146-CXR-EWC-JST-BUNTS1 |
| 76 | MSP, MKE | PHL, TTN, ILG, PNE, PTW | | MSP | PHL | No Action | DLL-J34-BAE-J34-DJB-J518-AVERE-J152-JST-BUNTS1 |
| | | | | | | Proposed Action | DLL-J34-CRL-CXR-EWC-JST-BUNTS1 |
| 77 | DTW, YIP, PTK, DET, YQG | BOS, BED, MHT, PWM, BGR, BTV | | DTW | BOS | No Action | TYCOB-YQG098-SURLY-J554-JHW-J82-ALB-GDM3 |
| | | | | | | Proposed Action | MOONN-BROKK-JHW-J82-ALB-GDM3 |
| | | | | | | | PISTN-DXO020-ADRIE-V450-ZR-V308-YXU-J16-FABEN-ALB-GDM |
| 78 | DTW, YIP, PTK, DET, YQG | IAD | | DTW | IAD | No Action | WINGS-V103-ACO-AIR-J162-MGW-JASEN4 |
| | | | | | | Proposed Action | MAARS1-ACO-AIR-MGW-JASEN4 |
| 79 | DTW, YIP, PTK, DET, YQG | DCA | | DTW | DCA | No Action | WINGS-V103-ACO-AIR-J34-BUCKO-BUCKO6 |
| | | | | | | Proposed Action | MAARS1-ACO-AIR-J34-BUCKO-BUCKO6 |
| 80 | DTW, YIP, PTK, DET, YQG | BWI | | DTW | BWI | No Action | WINGS-V103-ACO-AIR-EMI5 |
| | | | | | | Proposed Action | MAARS1-ACO-AIR-EMI5 |
| 81 | MDW, MLI, ORD, RFD | CLE, CGF, BKL, LNN | At or below FL270 at ZAU/ZOB boundary | MDW | CLE | No Action | GIJ-J146-PLAIN-VWV-WAKEM2 |
| | | | | | | Proposed Action | ELX-CRL-SSUNN-HIMEZ |

**Table C-2: Example MASE Airspace Route Changes**

| Reroute Number | Departure Airports | Arrival Airports | Altitude Restrictions | Example Departure Airport | Example Arrival Airport | Alternative | Example Route |
|---|---|---|---|---|---|---|---|
| 82 | DTW, YIP, PTK, DET, YQG | CLE, CGF, BKL, LNN | | DTW | CLE | No Action | WINGS-V103-GONNE-GONNE2 |
| | | | | | | Proposed Action | MAARS-HIMEZ |
| 83 | MKE, MSN, GRR | CLE, CGF, BKL, LNN | At or below FL290 at ZAU/ZOB boundary | GRR | CLE | No Action | SVM-V116-YQG-V103-GONNE |
| | | | | | | Proposed Action | CRL-MACCS-SSUNN-HIMEZ |
| 84 | LAN | CLE, CGF, BKL, LNN | At or below FL230 | LAN | CLE | No Action | SVM-GONNE2 |
| | | | | | | Proposed Action | SVM-MACCS-HIMEZ1 |
| 85 | SAN, LAX, LAS, DEN, MCI, PHX, SFO, ASE, TUS | CLE, CGF, BKL, LNN | At or below FL270 at ZOB/ZAU boundary | DEN | CLE | No Action | PLAIN3-MCK-J44-LNK-J146-PLAIN-VWV-WAKEM2 |
| | | | | | | Proposed Action | PLAIN3-MCK-J44-LNK-DSM-OBK-CRL-SSUNN-HIMEZ |
| 86 | STL, SUS | CLE, CGF, BKL, LNN | At or below FL170 at ZOB/ZID boundary | STL | BKL | No Action | GATWY4-ROD-WAKEM2 |
| | | | | | | Proposed Action | J134-JUDDI-CVG-DRUGA-TOOOK-MFD-ABERZ1 |
| 87 | DAL, DFW | CLE, CGF, BKL, LNN | At or below FL170 at ZOB/ZID boundary | DFW | CLE | No Action | DALL7-LIT-J131-PXV-J29-ROD-WAKEM2 |
| | | | | | | Proposed Action | DALL7-LIT-J131-PXV-CVG-DRUGA-TOOOK-MFD-ABERZ |
| 88 | IND | CLE, CGF, BKL, LNN | At or below FL170 at ZOB/ZID boundary | IND | CLE | No Action | ROD-WAKEM2 |
| | | | | | | Proposed Action | DQN-MFD-ABERZ |
| 89 | SEA | CLE, CGF, BKL, LNN | At or below FL290 at ZAU/ZOB boundary | SEA | CLE | No Action | J70-MLP-J70-LWT-ABR-BAE-SVM-GONNE2 |
| | | | | | | Proposed Action | J70-MLP-J70-LWT-ABR-BAE-J34-GRR-CRL-SSUNN-HIMEZ |
| 90 | MSP | CLE, CGF, BKL, LNN | At or below FL290 at ZAU/ZOB boundary | MSP | CLE | No Action | SNINE5-GRB-J106-FNT-GONNE |
| | | | | | | Proposed Action | DLL-J34-GRR-CRL-SSUNN-HIMEZ1 |
| 91 | AZO, SBN, EKM | CLE, CGF, BKL, LNN | | SBN | CLE | No Action | SEWTO-BRYTO-MODEM-ZOSER-PIONS-VWV-WAKEM2 |
| | | | | | | Proposed Action | LFD-CRL-SSUNN-HIMEZ |
| 92 | MBS | CLE, CGF, BKL, LNN | | MBS | CLE | No Action | V216-VASAR-YQG-GONNE-GONNE2 |
| | | | | | | Proposed Action | MBS-V133-SVM-MACCS-SSUNN-HIMEZ1 |
| 93 | IAH, MEM | CLE, CGF, BKL, LNN | At SGH at FL240 at ZID/ZOB boundary at | IAH | CLE | No Action | LFK4-LFK-J101-LIT-J131-PXV-J29-ROD-WAKEM2 |
| | | | | | | Proposed Action | LFK4-LFK-J101-LIT-J131-PXV-CVG-DRUGA-TOOOK-MFD-ABERZ |
| 94 | LEX, SDF | CLE, CGF, BKL, LNN | at ZID/ZOB boundary at FL170 | LEX | CLE | No Action | HYK-DQN-ROD-WAKEM2 |
| | | | | | | Proposed Action | CVG-DRUGA-TOOOK-MFD-ABERZ1 |
| 95 | BNA, MSY | CLE, CGF, BKL, LNN | At SGH at FL240 at ZID/ZOB boundary at | BNA | CLE | No Action | BWG-IIU-J39-ROD-WAKEM2 |
| | | | | | | Proposed Action | IIU-CVG-DRUGA-TOOOK-MFD-ABERZ |
| 96 | ATL, TYS | CLE, CGF, BKL, LNN | | ATL | CLE | No Action | NOTWO-VXV-J91-BULEY-J91-HNN-TVT-KEATN2 |
| | | | | | | Proposed Action | VXV-J91-BULEY-J91-HNN-TVT-KEATN2 |
| 97 | CLE, CGF, BKL, LNN | DEN, MDW, SBN, SFO, EKM, LAX | | CLE | DEN | No Action | SKY-VWV-GSH-J60-IOW-J10-LBF-SAYGE4 |
| | | | | | | Proposed Action | AMRST-VWV-GSH-J60-IOW-J10-LBF-SAYGE4 |
| 98 | CLE, CGF, BKL, LNN | PHX, LAS | | CLE | LAS | No Action | SKY-VWV-GSH-J60-BCE-GRNPA1 |
| | | | | | | Proposed Action | AMRST-VWV-GSH-J60-BCE-GRNPA1 |
| 99 | CLE, CGF, BKL, LNN | DPA | | BKL | DPA | No Action | SKY-VWV-GSH-EON-JOT |
| | | | | | | Proposed Action | AMRST1-VWV-EON-JOT |
| 100 | CLE, CGF, BKL, LNN | TOL | | BKL | TOL | No Action | SKY-SKY292-HARBS |
| | | | | | | Proposed Action | AMRST1-VWV |
| 101 | CLE, CGF, BKL, LNN | ORD | | CLE | ORD | No Action | SKY-VWV-VWV248-OXI095-SPANN-OXI3 |
| | | | | | | Proposed Action | AMRST1-VWV-OXI-OXI3 |
| 102 | CLE, CGF, BKL, LNN | DAY | | BKL | DAY | No Action | MFD-ROD-DQN |
| | | | | | | Proposed Action | OBRLN-ROD-DQN |

**Table C-2: Example MASE Airspace Route Changes**

| Reroute Number | Departure Airports | Arrival Airports | Altitude Restrictions | Example Departure Airport | Example Arrival Airport | Alternative | Example Route |
|---|---|---|---|---|---|---|---|
| 103 | CLE, CGF, BKL, LNN | LEX, SDF | | BKL | LEX | No Action | MFD-ROD-CVG |
| | | | | | | Proposed Action | OBRLN-ROD-CVG |
| 104 | CLE, CGF, BKL, LNN | FWA | | CLE | FWA | No Action | MFD-V8-FDY-V38 |
| | | | | | | Proposed Action | DJB-OBRLN-FDY |
| 105 | CLE, CGF, BKL, LNN | IAH | | BKL | IAH | No Action | MFD-ROD-J29-PXV-J131-LIT-J180-SWB-DAS |
| | | | | | | Proposed Action | OBRLN-FDY-RID-PXV-LIT-J180-SWB-DAS |
| 106 | CLE, CGF, BKL, LNN | MEM | | BKL | MEM | No Action | MFD-ROD-J29-PXV-WLDER4 |
| | | | | | | Proposed Action | DJB-OBRLN-FDY-RID-PXV-WLDER4 |
| 107 | CLE, CGF, BKL, LNN | LIT | | CLE | LIT | No Action | MFD-ROD-LIT |
| | | | | | | Proposed Action | DJB-OBRLN-FDY-RID-PXV |
| 108 | CLE, CGF, BKL, LNN | SAT | | CLE | SAT | No Action | MFD-ROD-J29-PXV-J131-LIT-J101-LFK-MARCS7 |
| | | | | | | Proposed Action | OBRLN-FDY-RID-PXV-J131-LIT-J101-LFK-MARCS7 |
| 109 | CLE, CGF, BKL, LNN | IND | | BKL | IND | No Action | MFD-ROD-CLANG5 |
| | | | | | | Proposed Action | OBRLN-FDY-MIE-CLANG5 |
| 110 | CLE, CGF, BKL, LNN | STL | | BKL | STL | No Action | MFD-ROD-VHP-VLA5 |
| | | | | | | Proposed Action | OBRLN1-FDY-VHP-VLA5 |
| 111 | CLE, CGF, BKL, LNN | MCI | | BKL | MCI | No Action | MFD-ROD-VHP-J80-CAP-BQS2 |
| | | | | | | Proposed Action | OBRLN1-FDY-VHP-J80-CAP-BQS2 |
| 112 | CLE, CGF, BKL, LNN | BNA | | BKL | BNA | No Action | MFD-ROD-J39-IIU-GUITR3 |
| | | | | | | Proposed Action | OBRLN-FDY-RID-IIU-GUITR3 |
| 113 | CLE, CGF, BKL, LNN | MSY | | CLE | MSY | No Action | DJB-APE-J186-BULEY-J91-VXV-J22-MEI-RYTHM3 |
| | | | | | | Proposed Action | OBRLN-FDY-RID-IIU-MCB-RYTHM3 |
| | | | | | | | HERAK-APE-J186-BULEY-J91-VXV-J22-MCB-RYTHM3 |
| 114 | CLE, CGF, BKL, LNN | MSN, RFD, PWK | | CLE | MSN | No Action | SKY-CRL-J34-BAE |
| | | | | | | Proposed Action | DJB-AMRST-ALPHE-J34-BAE |
| 115 | CLE, CGF, BKL, LNN | MSP, SEA | | CLE | MSP | No Action | SKY-CRL-J34-BAE-EAU6 |
| | | | | | | Proposed Action | DJB-AMRST-ALPHE-J34-BAE-EAU6 |
| 116 | CLE, CGF, BKL, LNN | GRR | | CLE | GRR | No Action | SKY-CRL-LAN |
| | | | | | | Proposed Action | DJB-AMRST-ALPHE |
| 117 | CLE, CGF, BKL, LNN | BTL, AZO | | BKL | AZO | No Action | SKY-CRL |
| | | | | | | Proposed Action | AMRST-VWV |
| 118 | CLE, CGF, BKL, LNN | MKE | | BKL | MKE | No Action | SKY-CRL-MKG-SUDDS |
| | | | | | | Proposed Action | AMRST-CRL-CRL316075-MKG-V2-SUDDS |
| 119 | CLE, CGF, BKL, LNN | GSO, BHM, MYR, LWB, ATL, CLT, CMH, CRW, CVG, FLL, ILN, JAX, LUK, MCO, MIA, PBI, RDU, RSW, TPA, TYS, CHS, MYGF | | CLE | ATL | No Action | DJB-APE-J186-ODF-MACEY2 |
| | | | | | | Proposed Action | DJB-HERAK-APE-J186-ODF-MACEY2 |
| 120 | CLE, CGF, BKL, LNN | YYZ | | BKL | YYZ | No Action | FAILS-V443-DOGGS-YXU-V98-YWT |
| | | | | | | Proposed Action | FAILS-V443-DOGGS-YXU-V98-YWT |
| 121 | CLE, CGF, BKL, LNN | DFW | | BKL | DFW | No Action | MFD-ROD-J29-PXV-FSM-BYP5 |
| | | | | | | Proposed Action | OBRLN-FDY-RID-PXV-LIT-BYP4-DFW |

**Table C-2: Example MASE Airspace Route Changes**

| Reroute Number | Departure Airports | Arrival Airports | Altitude Restrictions | Example Departure Airport | Example Arrival Airport | Alternative | Example Route |
|---|---|---|---|---|---|---|---|
| 122 | BDL, PVD, BOS, ABE, AVP, SWF, BGM | CVG | At or below FL310 at ZOB/ZID boundary | ABE | CVG | No Action | ETX-J80-KIPPI-J80-AIR-CINCE4 |
| | | | | | | Proposed Action | PSB-MMJ-BOWRR-CINCE4 |
| 123 | CYUL, BUF, ROC, SYR, BTV | CVG | At or below FL310 at ZOB/ZID boundary | BTV | CVG | No Action | SYR-J29-DJB-WAAHU-APE-CINCE4 |
| | | | | | | Proposed Action | SYR-CIP-MMJ-BOWRR-CINCE4 |
| 124 | CYYZ | CVG | | CYYZ | CVG | No Action | YQO-DJB-J83-APE-CINCE4 |
| | | | | | | Proposed Action | EWC-MMJ-BOWRR-CINCE4 |
| 125 | ALB, BGR, MHT, PWM | CVG | At or below FL310 at ZOB/ZID boundary | ALB | CVG | No Action | SYR-J29-DJB-J83-APE-CINCE4 |
| | | | | | | Proposed Action | SYR-CIP-MMJ-BOWRR-CINCE4 |
| 126 | LGA, EWR, JFK, ISP, TEB, PHL, MDT, HPN | CVG | | EWR | CVG | No Action | PARKE-J6-COLNS-J134-HNN-JAVIT1 |
| | | | | | | Proposed Action | PARKE-COLNS-HNN-JAVIT1 |
| 127 | CHO, ORF, RIC | CVG | At or above FL240 | CHO | CVG | No Action | MOL-HVQ-JAVIT1 |
| | | | | | | Proposed Action | HNN0900050-HNN-JAVIT1 |
| 128 | CHO, ORF, RIC | CVG | At or below FL220 at ZDC/ZID boundary | CHO | CVG | No Action | MOL-HVQ-JAVIT1 |
| | | | | | | Proposed Action | MOL-HNN-JAVIT1 |
| 129 | CVG | MIA | | CVG | MIA | No Action | BLGRS5-HYK-VXV-J43-ATL-J89-HITTR-J75-RSW-CYY3 |
| | | | | | | Proposed Action | NOTWO-WALET-FAGAN-TEPEE-DEEDS-WORPP-CYY3 |
| 130 | CVG | MIA | | CVG | MIA | No Action | BLGRS5-HYK-VXV-J43-PIE-CYY3 |
| | | | | | | Proposed Action | VXV-ATL-J89-HITTR-J75-RSW-CYY3 |
| 131 | CVG | FLL | | CVG | FLL | No Action | BLGRS5-HYK-VXV-J43-ATL-J89-HITTR-J75-TEPEE-FORTL4 |
| | | | | | | Proposed Action | NOTWO-WALET-FAGAN-TEPEE-FORTL4 |
| 132 | CVG | FLL | | CVG | FLL | No Action | BLGRS5-HYK-VXV-J46-AMG-J85-TAY-J75-TEPEE-FORTL4 |
| | | | | | | Proposed Action | VXV-ATL-J89-HITTR-J75-TEPEE-FORTL4 |
| 133 | CVG | PBI | | CVG | PBI | No Action | BLGRS5-HYK-VXV-J99-IRQ-J85-LLAKE-GULLO1 |
| | | | | | | Proposed Action | NOTWO-WALET-FAGAN-LEWRD-LLAKE-GULLO1 |
| 134 | CVG | PBI | | CVG | PBI | No Action | BLGRS5-HYK-VXV-J46-AMG-J85-LLAKE-GULLO1 |
| | | | | | | Proposed Action | BLGRS5-HYK-VXV-J43-ATL-J89-J91-INPIN-LLAKE-GULLO1 |
| 135 | CVG | ATL | | CVG | ATL | No Action | BLGRS5-HYK-GQO-RMG-RMG2 |
| | | | | | | Proposed Action | BLGRS5-IIU-BWG-RMG2 |
| 136 | CVG | MSY, BHM, MOB, JAN | | CVG | BHM | No Action | BLGRS5-HYK-LVT-VUZ |
| | | | | | | Proposed Action | BLGRS5-HYK-LVT-SYI-VUZ |
| 137 | CVG, LUK | ALB, BOS, MHT, SWF, BDL, AVP, PVD, PWM, LGA | | CVG | ALB | No Action | FFO-DJB-J82 |
| | | | | | | Proposed Action | CAVON-WADAL-EVLYN-DOCCK-ROCKT-CADRE-AHTIY-PSB-J49 |
| 138 | CVG, LUK | PHL | | CVG | PHL | No Action | CAVON-WADAL-EVLYN-DOCCK-CTW-JST-BUNTS1 |
| | | | | | | Proposed Action | CAVON-WADAL-EVLYN-DOCCK-ROCKT-CADRE-AHTIY-JST-BUNTS1 |
| 139 | CVG, LUK | ABE, MDT | | CVG | ABE | No Action | JODUB2-JODUB-HNN-JST-J152-HAR-V162-DUMMR |
| | | | | | | Proposed Action | CAVON-WADAL-EVLYN-DOCCK-ROCKT-CADRE-AHTIY-JST-HAR-V162-DUMMR |
| 140 | ORD, MDW | MEM | | MDW | MEM | No Action | EON-DNV-TTH-PXV-WLDER4 |
| | | | | | | Proposed Action | GUIDO-J73-PXV-WLDER4 |
| | | | | | | | RBS-FAM-ARG-GQE3 |

**Table C-2: Example MASE Airspace Route Changes**

| Reroute Number | Departure Airports | Arrival Airports | Altitude Restrictions | Example Departure Airport | Example Arrival Airport | Alternative | Example Route |
|---|---|---|---|---|---|---|---|
| 141 | ORD, MDW | RSW | | MDW | RSW | No Action | EON-DNV-TTH-BWG-SZW-PIE-SRQ5 |
| | | | | | | Proposed Action | GUIDO-J73-PXV-J73-SZW-J41-PIE-SRQ5 |
| 142 | ORD, MDW | TPA | | ORD | TPA | No Action | GUIDO-J73-SZW-DARBS1 |
| | | | | | | Proposed Action | GUIDO-J73-PXV-J73-SZW-DARBS1 |
| 143 | ORD, MDW | SRQ | | MDW | SRQ | No Action | GUIDO-J73-SZW-CLAMP4 |
| | | | | | | Proposed Action | GUIDO-J73-PXV-J73-SZW-CLAMP4 |
| 144 | ORD, MDW | ATL | | MDW | ATL | No Action | GUIDO-J73-BNA-RMG2 |
| | | | | | | Proposed Action | GUIDO-J73-PXV-BNA-RMG2 |
| 145 | ORD, MDW | EVV | | MDW | EVV | No Action | EON |
| | | | | | | Proposed Action | GUIDO |
| 146 | ORD, MDW | BNA | | MDW | BNA | No Action | GUIDO-J73-PXV-CCT-HEHAW4 |
| | | | | | | Proposed Action | EON-DNV-TTH-HEHAW4 |
| 147 | ORD, MDW | CVG | | ORD | CVG | No Action | EON-DNV-SHB1 |
| | | | | | | Proposed Action | EON-DNV-SHB1 |
| 148 | ORD, MDW | CHA, BHM, HSV | | MDW | BHM | No Action | GUIDO-J73-BNA-J39-VUZ |
| | | | | | | Proposed Action | EON-DNV-BNA-J39-VUZ |
| 149 | ORD, MDW | MIA | | MDW | MIA | No Action | EON-DNV-TTH-BWG-SZW-J43-PIE-CYY3 |
| | | | | | | Proposed Action | EON-DNV-TTH-SWAPP-ATL-J89-HITTR-J75-RSW-CYY3 |
| 150 | ORD, MDW | MIA | | MDW | MIA | No Action | GUIDO-J73-SZW-J43-PIE-CYY3 |
| | | | | | | Proposed Action | GUIDO-J73-SZW-J43-PIE-CYY3 |
| 151 | ORD, MDW | FLL | | MDW | FLL | No Action | EON-DNV-TTH-BWG-OTK-TEPEE-FORTL4 |
| | | | | | | Proposed Action | EON-DNV-TTH-SWAPP-ATL-J89-HITTR-J75-TEPEE-FORTL4 |
| 152 | ORD, MDW | FLL | | MDW | FLL | No Action | GUIDO-J73-SZW-J43-PIE-FORTL4 |
| | | | | | | Proposed Action | GUIDO-J73-SZW-J43-PIE-FORTL4 |
| 153 | ORD, MDW | PBI | | MDW | PBI | No Action | GUIDO-J73-SZW-CTY-LLAKE3 |
| | | | | | | Proposed Action | EON-DNV-TTH-SWAPP-ATL-J89-J91-INPIN-LLAKE3 |
| 154 | ORD, MDW | PBI | | MDW | PBI | No Action | EON-DNV-TTH-IIU-ODF-AMG-J85-GNV-LAL-LLAKE3 |
| | | | | | | Proposed Action | GUIDO-J73-SZW-CTY-LLAKE3 |
| 155 | ORD, MDW | JAX | | MDW | JAX | No Action | EON-DNV-VHP-J24-FLM-J43-VXV-J46-AMG-AMG2 |
| | | | | | | Proposed Action | EON-DNV-TTH-SWAPP-ATL-AMG-AMG2 |
| 156 | ORD, MDW | MCO | | MDW | MCO | No Action | EON-DNV-TTH-BWG-GQO-ATL-J89-OTK-LEESE1 |
| | | | | | | Proposed Action | EON-DNV-TTH-SWAPP-ATL-J89-OTK-LEESE1 |
| 157 | ORD, MDW | CRW, ORF, RIC, GSO, ROA, CAE, MYR, CLT, TRI, TYS, GSP, CHS | | MDW | CAE | No Action | EON-DNV-TTH-IIU-J99-VXV-SPA |
| | | | | | | Proposed Action | EON-DNV-VHP-J24-FLM-J43-VXV-SPA |
| 158 | ORD, MDW | RDU | | MDW | RDU | No Action | EON-DNV-VHP-FLM-ROA-SBV4 |
| | | | | | | Proposed Action | EON-DNV-VHP-J24-FLM-BKW-ROA-SBV4 |